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Catalogue

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See latest NET PRICE LIST.
KOLESCH & CO.

KOLESCH & CO.

138 FULTON ST.
NEW YORK

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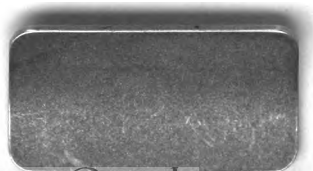
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1. (1) *Trigonometry* (1) *Trigonometry* (1) *Trigonometry*
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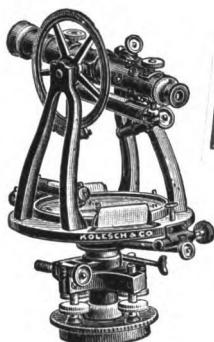
OF

Drawing and Tracing Papers

Sun Print Papers and Equipments

Drawing Instruments and Materials

Surveying Instruments, Accessories, etc.



IMPORTANT
Prices are subject to change without notice.
See latest NET PRICE LIST.
KOLESCH & CO.

Kolesch & Co.

Established 1885

138 Fulton Street near Broadway

NEW YORK

Phones, Cortland { 1535
 { 1536

Cable Address, Kolesch, New York
Codes, Western Union, A. B. C. 5a

Eleventh Edition . . . Price 50 Cents

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NOTICE.

In ordering from this Catalogue the number of the articles should be given, also size or other description of the articles wanted.

To firms of known responsibility we will sell on 30 days' time.

Firms who have not dealt with us heretofore will confer a favor by sending references or remittance with first order.

If goods are ordered C. O. D., a remittance of Five Dollars must accompany the order.

The prices in this catalogue include all necessary packing or boxes, except for export or where very bulky or heavy goods require special packing.

On Surveying Instruments sent by express C. O. D. we will allow three days' examination.

Small packages will be sent by parcel post, for which postage will be added to the bill. We insure all mail packages free of charge.

All prices subject to change without notice.

All goods listed in this Catalogue are guaranteed to be exactly as represented. Should it happen that any article is not satisfactory, same will be promptly replaced. It has always been our policy to satisfy our customers to the fullest extent and thereby maintain the reputation we have established during the past thirty-two years.

Prices in this issue supersede all previous editions.

KOLESCH & CO.



Water Color and Pen and Ink Boards

For Illustrators and Designers.

3. **"Premier" Illustration Boards**, covered with an Extra Heavy and Extra Hard Hot Pressed Paper, mounted on heavy boards. A First Class article for all Pen and Ink Work and particularly recommended for Air Brush Work:
 22 x 28 inches.....per dozen, \$5.25.....per sheet, \$.45
4. **"Murillo" Illustration Boards**, covered with a fine grade of Slightly Grained Water Color Paper, mounted on heavy boards. Suitable for all high grade Water Color Sketches or Washes:
 30 x 40 inches.....per dozen, \$5.00.....per sheet, \$.50
 20 x 30 inches.....per dozen, 3.00.....per sheet, .30
5. **"Rembrandt" Illustration Boards**, covered with a fine grade of Slightly Grained Water Color Paper, mounted on medium thick boards. Suitable for Water Color, Pencil or Charcoal Sketches:
 30 x 40 inches.....per dozen, \$3.75.....per sheet, \$.35
 20 x 30 inches.....per dozen, 2.25.....per sheet, .20
6. **"Steinbach" Boards**, covered with Steinbach Paper, mounted on heavy boards.
 30 x 40 inches.....per dozen, \$6.75.....per sheet, \$.60
 22 x 30 inches.....per dozen, 4.00.....per sheet, .35
7. **"Special Steinbach" Boards**, covered with Steinbach Paper, mounted on a fine grade of mounting boards:
 30 x 40 inches.....per dozen, \$9.50.....per sheet, \$.95
 22 x 28 inches.....per dozen, 4.50.....per sheet, .40
8. **"High Finish" Illustration Boards**, covered with Hot Pressed Illustration Paper No. 96, mounted on heavy boards:
 22 x 28 inches.....per dozen, \$4.50.....per sheet, \$.40
- "Whatman's" Boards**, covered with Cold Pressed Whatman's Water Color Paper, mounted on heavy boards:
 26½ x 39½ inches.....per dozen, \$12.00.....per sheet, \$1.20
 22 x 30 inches.....per dozen, 6.00.....per sheet, .60
- "Ross" Relief Hand Stipple Drawing Papers**, made in various patterns:
 11 x 14 inches.....per dozen, \$3.00.....per sheet, \$.30
 14 x 22 inches.....per dozen, 5.00.....per sheet, .50
 22 x 28 inches.....per dozen, 7.50.....per sheet, .75

Samples of any of above sent on application. Complete sample book, 15c.



Bristol Boards.

18 French Bristol Boards. High Finish. Smooth Surface. Fine Quality:

22 x 28 inches,	.....per 100 sheets.....per dozen.....per sheet.	
2 ply.....	\$8.00.....\$1.00.....	\$.10
3 ply.....	12.00.....1.50.....	.15
4 ply.....	15.50.....2.00.....	.20
5 ply.....	29.00.....4.00.....	.40
6 ply.....	34.00.....4.50.....	.45

19 French Bristol Boards. Medium Finish. Slightly grained surface.

Fine quality:

22 x 28 inches,	.....per 100 sheets.....per dozen.....per sheet.	
2 ply.....	\$8.00.....\$1.00.....	\$.10
3 ply.....	12.00.....1.50.....	.15
4 ply.....	15.50.....2.00.....	.20

20 "Fulton" Bristol Boards. Smooth. Medium quality:

22 x 28 inches,	.....per 100 sheets.....per dozen.....per sheet.	
2 ply.....	\$6.00.....\$.80.....	\$.08
3 ply.....	7.00.....1.00.....	.10

22 Scratch Board, sometimes called Chalk Board, for Black and White work and Process Reproduction:

Imperial, 22 x 28 inches..... per dozen, \$4.00....per sheet, \$.35

Reynolds' Bristol Boards.

25 Reynolds' Bristol Boards, smooth surface, 2-ply:

Cap	12½ x 15¼.....per doz.	\$.80
Demy	14½ x 18¼.....per doz.	1.25
Medium	16½ x 20¾.....per doz.	1.65
Royal	18¼ x 22¾.....per doz.	2.10

26 Reynolds' Bristol Boards, smooth surface, 3-ply:

Cap	12½ x 15¼.....per doz.	\$1.20
Demy	14½ x 18¼.....per doz.	1.85
Medium	16½ x 20¾.....per doz.	2.50
Royal	18¼ x 22¾.....per doz.	3.20
Imperial	21½ x 28¾.....per doz.	6.10

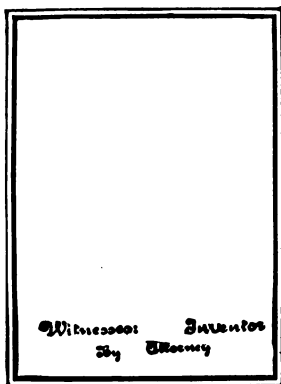
27 Reynolds' Bristol Boards, smooth surface, 4-ply:

Cap	12½ x 15¼.....per doz.	\$1.60
Demy	14½ x 18¼.....per doz.	2.45
Medium	16½ x 20¾.....per doz.	3.35
Royal	18¼ x 22¾.....per doz.	4.25
Imperial	21½ x 28¾.....per doz.	8.15

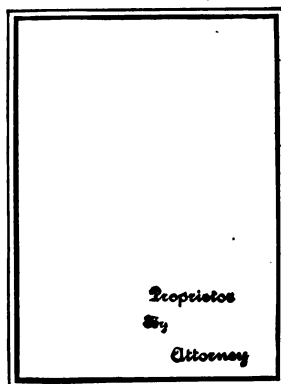
Samples of any of above sent on application. Complete sample book, 10c.

Patent Office Blanks and Mounting Boards.

42
&
43



46



Patent Office Blanks, printed with border as prescribed by U. S. Patent Office:

		Per gross.	Per doz.	Per sheet
42	10 x 15 on 2 ply Reynolds' Bristol Board..	\$11.00.....	\$1.10.....	\$.10
43	10 x 15 on 3 ply Reynolds' Bristol Board..	14.50.....	1.45.....	.15

Patent Office Blanks, printed with border as prescribed by U. S. Patent Office, with an additional faint cutting line at 10 x 15 inches. This gives a margin useful for inserting thumb tacks, memorandums, testing ruling pens, etc.:

		Per gross.	Per doz.	Per sheet
44	11 x 15 on 2 ply Reynolds' Bristol Board..	\$12.00.....	\$1.20.....	\$.12
45	11 x 15 on 3 ply Reynolds' Bristol Board..	15.50.....	1.55.....	.17

46 Trade Mark Bristol Boards, printed with lettering and ruling as prescribed by U. S. Patent Office.
10 x 15, per gross \$14.50.....per doz. \$1.45.....per sheet \$.15

47 Mailing Envelopes for Patent Office Drawings, made of stiff Manila Paper lined with 2 pieces of corrugated board; with address of Commissioner of Patents printed on outside. A safer way of mailing patent drawings than rolling in a tube:
per gross \$10.00....per doz. \$.87...per ½ doz. \$.50...each \$.10

Mat Boards, rough embossed surface, for mounting drawings, sketches, etc., also for making picture mats; **gray** on one side and **white** on the other. Either side can be used:

48	Double 20 x 30 in. (about 3/32 in. thick)	per doz. \$2.50	per sheet \$.25
49	Double 30 x 40 in. (about 3/32 in. thick)	per doz. 5.00	per sheet .50
50	Treble 38 x 52 in. (about 1/8 in. thick)	per doz. 9.00	per sheet .95

Mounting Boards, Best Quality. White. For mounting drawings, sketches, etc.

51	4 ply 22 x 28 in.	per 100 \$ 6.00....per doz. \$.80....per sheet \$.08
51½	6 ply 22 x 28 in.	per 100 7.20....per doz. .95....per sheet .10
52	8 ply 22 x 28 in.	per 100 8.40....per doz. 1.20....per sheet .15
52½	10 ply 22 x 28 in.	per 100 10.50....per doz. 1.50....per sheet .20
53	24 ply 22 x 28 in.	per 100 18.00....per doz. 2.50....per sheet .25
53½	10 ply 30 x 40 in.	per 100 23.00....per doz. 4.00....per sheet .40
54	24 ply 30 x 40 in.	per 100 50.00....per doz. 7.00....per sheet .75

Samples of any of above sent on application. Complete sample book, 10c.



Drawing Papers in Rolls.

- 55 Chartographic Drawing Paper. White, Smooth Surface. Strongest paper made. Will stand unlimited erasing. Suitable for maps or other drawings where great strength and durability are desired:**

	Per 50 yds.	25 yds.	10 yds.	yard
24 inches wide....	\$ 7.00	\$3.75	\$1.60	\$.20
36 inches wide....	10.00	5.25	2.15	.25
62 inches wide....	19.00	9.75	4.00	.45
72 inches wide....		11.75	4.95	.55
In original rolls of 40-50 pounds.....				per lb. .45

Sheets of various sizes cut to order at proportionate rates.

- 62 Eggshell Drawing Paper. Thin. White. Rough Surface:**

	Per 50 yds.	25 yds.	10 yds.	yard
58 inches wide....	\$16.60	\$9.50	\$4.00	\$.45

- 65 Eggshell Drawing Paper. Medium. White. Rough Surface:**

	Per 50 yds.	25 yds.	10 yds.	yard
36 inches wide....	\$13.25	\$ 7.20	\$3.00	\$.33
42 inches wide....	14.75	8.40	3.50	.36
58 inches wide....	19.50	10.80	4.50	.45

- 68 Eggshell Drawing Paper. Heavy. White. Rough Surface:**

	Per 25 yds.	10 yds.	yard
58 inches wide....	\$13.50	\$5.75	\$.65
In original rolls of 30-40 pounds, Eggshell Papers Nos. 62, 65 and 68, per lb.....			.50

- 75 German Drawing Paper. White. Slightly grained surface for general work:**

	Per 50 yds.	25 yds.	10 yds.	yard
36 inches wide....	\$5.75	\$3.00	\$1.50	\$.20
42 inches wide....	6.50	3.50	1.75	.24
In original rolls of 30-40 pounds.....				per lb. .35

Sheets of various sizes cut to order at proportionate rates.

- 81 Metropolitan Drawing Paper. Cream Color, slightly grained surface for general work. This paper is tough and on account of the cream color, is agreeable to the eye. Will take ink, pencil or water color and will stand severe erasing:**

	Per 100 yds.	50 yds.	25 yds.	10 yds.	yard
30 inches wide.....	\$8.75	\$4.60	\$2.40	\$1.00	\$.11
36 inches wide.....	10.40	5.45	2.85	1.20	.13
42 inches wide.....	12.25	6.40	3.35	1.40	.15
72 inches wide.....	21.60	11.35	5.95	2.50	.30
In original rolls of 40-50 pounds.....					per lb. .29

For Metropolitan in sheets see No. 91.

Steinbach's Paper, a very fine white paper with slightly grained surface; used for pencil, crayon and water color sketches:

- 85** 54 inches wide, Medium Thick, roll of 10 yds. \$3.00, per yd. \$.35
86 54 inches wide, Thick, roll of 10 yds. 4.50, per yd. .50

Samples of any of above sent on application. Complete sample book, 10c.

Drawing Papers in Sheets

91 Metropolitan Drawing Paper. Cream Color... Same paper as No. 81:

		per ream	per quire	per sheet
Royal	18 x 24 in.	\$18.70	\$1.10	\$.08
Imperial	22 x 30 in.	27.20	1.60	.10
Standard	24 x 36 in.	35.70	2.10	.15
Double Elephant	27 x 40 in.	44.20	2.60	.17

95 "Rembrandt" Illustration Paper. White. Slightly grained surface. For Water Color, Charcoal and Pastel Drawings. Highly recommended for black and white reproductions:

		per ream	per quire	per sheet
Cap	10 x 15 in.	\$ 7.65	\$.45	\$.04
Demy	15 x 20 in.	12.75	.75	.06
Imperial	22 x 30 in.	21.25	1.25	.08
Double Elephant	30 x 40 in.	34.00	2.00	.10

96 "High Finish" Illustration Paper. Heavy. Smooth and very hard surface:

Imperial 23 x 36 in. per quire \$3.00..per doz. \$1.75..per sheet \$.20

100 Academy Drawing Paper (for school use) White. Medium surface:

Cap	14 x 17 in.	per ream \$ 3.60	per quire \$.20
Demy	15½ x 19½ in.	per ream 5.80	per quire .35
Medium	18 x 23 in.	per ream 8.00	per quire .45
Royal	19 x 24 in.	per ream 10.00	per quire .60
Imperial	22 x 30 in.	per ream 14.00	per quire .75

101 French Charcoal Drawing Paper. Ordinary.

19 x 25 in. White or assorted tints.....per quire \$.75

102 Michallet Charcoal Drawing Paper.

19 x 25 in. White or assorted tints.....per quire \$1.00

Whatman's Drawing Paper made in three different surfaces:

Hot pressed Whatman's Paper has a smooth surface, mostly used for fine line drawings, pen and ink sketches, etc.

Cold pressed has a slightly grained surface, used for general and finely finished water color drawings.

Extra Rough has a coarsely grained surface, used for very bold drawings and water color work, and is only made in Royal, Imperial and Double Elephant.

103 Whatman's Hand Made Paper. Best selected:

Cap	13 x 17 in.	per quire \$ 1.00	per sheet \$.05
Demy	15 x 20 in.	per quire 1.55	per sheet .08
Medium	17 x 22 in.	per quire 2.25	per sheet .11
Royal	19 x 24 in.	per quire 3.00	per sheet .14
Super Royal	19 x 27 in.	per quire 3.45	per sheet .16
Imperial	22 x 30 in.	per quire 5.00	per sheet .23
Double Elephant	27 x 40 in.	per quire 9.35	per sheet .43
Antiquarian	31 x 53 in.	per quire 35.75	per sheet 1.65
Antiquarian	Retree	per quire 28.60	per sheet 1.30

Prices for Retree or second quality furnished on application.

104 Whatman's Extra Heavy. Best selected:

Imperial	22 x 30 in.	per quire \$ 9.80	per sheet \$.45
Double Elephant	27 x 40 in.	per quire 14.75	per sheet .68

Samples of any of above sent on application. Complete sample book, 10c.

Mounted Drawing Papers in Rolls and in Sheets

- 105 Chartographic Drawing Paper. Mounted on Muslin. Heavy. Smooth Surface. Strongest paper made:**
- | |
|---|
| 36 inches wide.....per 10 yards, \$ 6.35.....yard, \$.80 |
| 62 inches wide.....per 10 yards, 13.00.....yard, 1.50 |
| 72 inches wide.....per 10 yards, 16.75.....yard, 2.00 |
- 108 Eggshell Drawing Paper. Mounted on Muslin. Medium. Rough Surface:**
- | |
|---|
| 36 inches wide.....per 10 yards, \$ 7.20.....yard, \$.85 |
| 42 inches wide.....per 10 yards, 8.30.....yard, 1.00 |
| 58 inches wide.....per 10 yards, 13.00.....yard, 1.60 |
- 109 German Drawing Paper. Mounted on Muslin. White. Medium Thick. Slightly grained surface:**
- | |
|--|
| 36 inches wide.....per 10 yards, \$5.70.....yard, \$.70 |
| 42 inches wide.....per 10 yards, 6.55.....yard, .80 |
- 111 Metropolitan Drawing Paper. Mounted on Muslin. Cream Color. Slightly grained surface:**
- | |
|---|
| 30 inches wide.....per 10 yards, \$ 5.20.....yard, \$.60 |
| 36 inches wide.....per 10 yards, 5.40.....yard, .65 |
| 42 inches wide.....per 10 yards, 6.20.....yard, .75 |
| 62 inches wide.....per 10 yards, 11.50.....yard, 1.40 |
- 112 Whatman's Drawing Paper. Mounted on Muslin. When ordering, please specify whether "Hot Pressed" or "Cold Pressed" is desired:**
- | | Per doz. | Per sheet |
|--|--------------|-----------|
| Royal .....19 x 24 in.....Selected Best, | \$ 4.75..... | \$.48 |
| Imperial .....22 x 30 in.....Selected Best, | 7.00..... | .70 |
| Double Elephant..27 x 40 in.....Selected Best, | 12.00..... | 1.20 |
| Antiquarian .....31 x 53 in.....Selected Best, | 30.00..... | 3.00 |
| Antiquarian .....31 x 53 in.....Retrée. | 25.00..... | 2.50 |

Samples of any of above sent on application. Complete sample book for 10c.

Sketch Blocks

- 115 Engineer's Cross Section Blocks, 10 x 10 to the inch, each inch line heavy:**
- | | | |
|------------------------------|-------------------------|---------------------|
| Each, 6 x 9 in., \$.40..... | 9 x 12 in., \$.75..... | 12 x 18 in., \$1.40 |
|------------------------------|-------------------------|---------------------|
- 116 Architect's Cross Section Blocks, 8 x 8 to the inch, each inch line heavy:**
- | | | |
|------------------------------|-------------------------|---------------------|
| Each, 6 x 9 in., \$.40..... | 9 x 12 in., \$.75..... | 12 x 18 in., \$1.40 |
|------------------------------|-------------------------|---------------------|
- 117 Whatman's Sketch Blocks, made of Whatman's Cold Pressed Water Color Paper:**
- | | | | |
|-------------------------|--------------------|---------------------|--------------------|
| Each, 5 x 7 in. \$.40. | 7 x 10 in. \$.75. | 10 x 14 in. \$1.50. | 14 x 20 in. \$2.65 |
|-------------------------|--------------------|---------------------|--------------------|
- Blocks of Hot Pressed Whatman's Paper at the same price.
- 118 "Triplex" Sketch Blocks, made of Triplex paper No. 90. The Cream color of this paper makes it particularly suitable for sketches for pencil, ink or color:**
- | | | |
|------------------------------|-------------------------|---------------------|
| Each, 6 x 9 in., \$.25..... | 9 x 12 in., \$.45..... | 12 x 18 in., \$.90 |
|------------------------------|-------------------------|---------------------|

Other sizes of sketch blocks made to order at short notice at proportionate rates.

Detail Paper in Rolls.

- 130 "Bleecker" Detail Paper, Medium, buff color, Cold Pressed Surface, will bear severe erasing:**

	Per 100 yds.	50 yds.	25 yds.	10 yds.
36 inches wide.....	\$4.00.....	\$2.25.....	\$1.50.....	\$.60
42 " "	4.70.....	2.60.....	1.75.....	.75
48 " "	5.35.....	2.95.....	1.95.....	.87
54 " "	6.00.....	3.25.....	2.25.....	1.00

- 135 "Bleecker" Detail Paper, Heavy, buff color, Cold Pressed Surface, will bear severe erasing:**

	Per 100 yds.	50 yds.	25 yds.	10 yds.
36 inches wide.....	\$5.00.....	\$2.75.....	\$1.75.....	\$.75
42 " "	5.75.....	3.10.....	1.95.....	.85
48 " "	6.75.....	3.65.....	2.25.....	1.00
54 " "	7.50.....	4.00.....	2.40.....	1.10

- 150 "Beekman" Detail Paper, Medium, salmon color, Cold Pressed Surface, will bear severe erasing:**

	Per 100 yds.	50 yds.	25 yds.	10 yds.
36 inches wide.....	\$4.00.....	\$2.25.....	\$1.50.....	\$.60
42 " "	4.70.....	2.60.....	1.75.....	.75
48 " "	5.35.....	2.95.....	1.95.....	.87
54 " "	6.00.....	3.25.....	2.25.....	1.00

- 155 "Beekman" Detail Paper, Heavy, salmon color, Cold Pressed Surface, will bear severe erasing:**

	Per 100 yds.	50 yds.	25 yds.	10 yds.
36 inches wide.....	\$5.00.....	\$2.75.....	\$1.75.....	\$.75
42 " "	5.75.....	3.10.....	1.95.....	.85
48 " "	6.75.....	3.65.....	2.25.....	1.00
54 " "	7.50.....	4.00.....	2.40.....	1.10

Any of above Detail Papers in original rolls of 100-150 lbs.....per lb. .12

- 158 Smooth Detail Paper, suitable for patterns, stencils or stone-yard drawings. Made in the following weights: X, XX, XXX, XXXX:**

36, 40, 48 and 54 inches wide. In original rolls of 100-150 pounds, per lb. \$.10

- 160 Manilla Sketching Paper, light weight, suitable for preliminary drawings or details where no great strength is required. Will bear erasing and will take ink or pencil:**

	Per 100 yds.	50 yds.	25 yds.
40 inches wide.....	\$3.25.....	\$1.85.....	\$1.00
48 " "	4.00.....	2.20.....	1.25

Samples of any of above sent free on application. Complete sample book for 10c.



Tracing Cloth

164 "Miusa" Tracing Cloth. (made in U. S. A.) Dull Back.

	24 in.	30 in.	36 in.	42 in.
24 yard rolls.....	\$6.90	\$7.20	\$8.00	\$10.75
Per yard .....	.35	.36	.40	.84

165 "Pellucid" Tracing Cloth. Dull Back. Very transparent. Particularly recommended on account of its erasing qualities and the absence of pin holes:

	18 in.	30 in.	36 in.	42 in.	48 in.	54 in.
24 yard roll.....	\$4.50	\$7.75	\$8.50	\$11.00	\$15.00	\$16.00
12 yard roll.....	2.50	4.25	4.70	6.00	8.25	8.80
Per yard .....	.23	.39	.43	.55	.75	.80

166 Imperial Tracing Cloth. Dull Back.

	30 in.	36 in.	42 in.	48 in.	54 in.
24 yard roll.....	\$9.00	\$10.00	\$13.00	\$17.50	\$18.50
Per yard .....	.45	.50	.65	.90	.95

168 "Stuyvesant" Pencil Tracing Cloth. Dull Back.

	30 in.	36 in.	42 in.
24 yard rolls.....	\$7.20	\$8.00	\$10.75

169½ "Fulton" Plotting Cloth. Heavy. For Surveyors and Engineers.

Suitable for drawings of all kinds where strength and durability are required. Stands severe erasing and will not shrink or stretch under atmospheric changes. Used in many cases where mounted paper was formerly used. Besides the qualities above mentioned this cloth has the advantage that serviceable blue prints can be made from ink drawings made on same, thereby in many cases saving the cost of a tracing.

	30 in.	36 in.	42 in.	54 in. wide
50 yard rolls.....	\$10.75	\$12.00	\$17.00	\$20.50
25 yard rolls.....	5.50	6.15	8.65	10.50
10 yard rolls.....	2.25	2.50	3.55	4.30

Tracing Cloth in Sheets

Furnished with border lines and titles to match customer's design. Printed with a special ink which will not wash off like printers' ink under the application of any chemicals which may be used to clean pencil marks and dirt from finished tracings. Further this ink, unlike printers' ink, is just as black and opaque as black drawing ink and will therefore blue print as clearly and sharply as the lines of the drawing.

	1,000	500	300	200	100 sheets
9 x 12 in. Printed	\$39.00	\$23.50	\$17.25	\$14.00	\$11.00
Not Printed....	27.00	13.90	8.60	5.90	3.10
12 x 18 in. Printed	\$66.50	\$39.00	\$27.50	\$22.00	\$16.00
Not Printed....	52.00	26.80	16.50	11.50	5.90
18 x 24 in. Printed	\$121.50	\$69.00	\$47.00	\$36.00	\$24.00
Not Printed....	102.00	52.50	32.50	22.50	11.60
24 x 36 in. Printed	\$225.00	\$124.00	\$82.00	\$60.50	\$38.00
Not Printed....	202.00	105.00	65.00	44.60	23.00
30 x 42 in. Printed	\$332.00	\$179.00	\$117.00	\$85.00	\$51.00
Not Printed....	308.00	159.00	99.00	68.00	35.00

Prices for other sizes and quantities on application.

Samples of any of above sent on application. Complete sample book, 10c.



Tracing Cloth Powder

- 170 **Tracing Cloth Powder**, for spreading on tracing cloth to remove any superfluous grease or oil in order to allow the ink to flow more freely on the cloth:
In tin shakers.....per dozen, \$1.50.....each, \$.15

"Houston" Tracing Cloth Cleaner

- 170½ **"Houston" Tracing Cloth Cleaner**. For removing pencil marks, dirt or grease from finished tracings without injuring the waterproof ink lines or affecting the fabric of the cloth.
NON INFLAMMABLE:
Quart, \$2.00.....Pint, \$1.25.....½ Pint, \$.75

"Pellucid" Solution

- 171 **"Pellucid" Solution**. **Non Inflammable**. For making tracings, negatives and drawings transparent so that they may be blue printed readily. Will not affect ink or pencil marks, and will not damage the original or the print:
Gallon, \$3.00.....½ Gallon, \$1.75.....Quart, \$1.00.....Pint, \$.75

"Imperial" Eradicator

- 171½ **"Imperial" Eradicator**. For Erasing Waterproof Drawing Inks of any color without injury to the tracing cloth:
Pint, \$3.15..½ Pint, \$1.70..4-oz. bottle, \$.90..1-oz. bottle, \$.30



Tracing Paper in Rolls

- 172 "Barclay" Transparent Sketching Paper. White. Unprepared.**
 Very strong. Suitable for details and preliminary sketches. Will take pencil, ink or water colors and stands severe erasing with knife or rubber:
- | | | | |
|--------------------|-------------|-------------|-------------|
| | 30 in. | 36 in. | 60 in. wide |
| 50 yard rolls..... | \$1.75..... | \$2.00..... | \$3.25 |
- 174 "Howard" Tracing Paper. White. Very transparent.** Has a slight grain which takes pencil or ink readily. Contains no oil or other preparations and will therefore not turn yellow or brittle with age:
- | | | |
|--------------------|-------------|-------------|
| | 29 in. | 58 in. wide |
| 44 yard rolls..... | \$2.30..... | \$4.60 |
| 22 yard rolls..... | 1.25..... | 2.30 |
- 174½ "Nassau" Tracing Paper. White. Unprepared. Very transparent.**
 Has a slight grain suitable for ink or pencil:
- | | |
|---------------------------------|--------|
| 44 yard rolls, 58 in. wide..... | \$2.75 |
| 22 yard rolls, 58 in. wide..... | 1.50 |
- 175 "Pellucid" Tracing Paper. Thin. Unprepared. Very transparent and tough. Smooth:**
- | | |
|---------------------------------|--------|
| 50 yard rolls, 42 in. wide..... | \$3.50 |
| 20 yard rolls, 42 in. wide..... | 1.50 |
- 176 "Pellucid" Tracing Paper. Medium. Unprepared. Very transparent and very tough.** Suitable as a tracing cloth substitute, as very good blue prints can be made from tracings drawn on this paper.
- | | | | |
|--------------------|-------------|-------------|-------------|
| | 29 in. | 42 in. | 58 in. wide |
| 50 yard rolls..... | \$4.25..... | \$4.50..... | \$7.50 |
| 20 yard rolls..... | 1.85..... | 2.00..... | 3.50 |
- 177 "Beekman" Tracing Paper. White. Unprepared. Very tough and transparent. Slightly grained surface.** Suitable for full size details or scale drawings. Good blue prints can be made from pencil drawings made on this paper:
- | | |
|---------------------------------|--------|
| 50 yard rolls, 42 in. wide..... | \$3.50 |
| 20 yard rolls, 42 in. wide..... | 1.50 |
- 178 "Cortland" Tracing Paper. Smooth. Wax Finish. Very tough and transparent.** Frequently used as a substitute for tracing cloth. Very good blue prints can be made from tracings drawn on this paper.
- | | | | |
|--------------------|-------------|-------------|-------------|
| | 29 in. | 40 in. | 58 in. wide |
| 20 yard rolls..... | \$2.50..... | \$3.20..... | \$4.50 |
- 179 Anglo Tracing Paper. Oiled. Medium Thick. Suitable for designers:**
- | | |
|---------------------------------|--------|
| 20 yard rolls, 40 in. wide..... | \$2.75 |
|---------------------------------|--------|

Samples of any of above sent on application. Complete sample book, 10c.

Tracing Paper in Rolls—Continued

- 180 Parchment Tracing Paper. Thin. Very transparent:**
 20 yard rolls, 39 in. wide.....\$2.00
- 181 Parchment Tracing Paper. Medium. Very hard smooth surface. Highly transparent:**
 20 yard rolls, 39 in. wide.....\$3.50
- 182 Parchment Tracing Paper. Heavy. Very hard smooth surface. Highly transparent:**
 20 yard rolls, 39 in. wide.....\$4.20
- 184 "Bond" Tracing Paper. White. Very tough. Slightly grained surface:**
 50 yard rolls, 42 in. wide.....\$3.00
 20 yard rolls, 42 in. wide..... 1.35
- 185 "Glass" Tracing Paper. Thin. Transparent like glass:**
 50 yard rolls, 42 in. wide.....\$3.50
 20 yard rolls, 42 in. wide..... 1.50
- 185½ "Pearl" Tracing Paper. Thin. Very transparent. Mat finish:**
 50 yard rolls, 42 in. wide.....\$3.50
 20 yard rolls, 42 in. wide..... 1.50
- 186 Manilla Tracing Paper. For tracing details or full size drawings:**
- | | 40 in. | 48 in. wide |
|---------------------|-------------|-------------|
| 100 yard rolls..... | \$2.40..... | \$3.00 |
| 50 yard rolls..... | 1.25..... | 1.60 |
- 189 "Fulton" Tracing Paper. Cream Colored. Very tough and transparent. Suitable for all tracings which are intended to stand rough handling:**
 50 yard rolls, 48 in. wide.....\$3.50
 20 yard rolls, 48 in. wide..... 1.50

Samples of any of above sent on application. Complete sample book, 10c.

For Tracing Papers in sheets see page 14.



Tracing Papers in Sheets.

- 190 "Pellucid" Tracing Paper. Thin. (Same as No. 175):**
 20 x 27 inchesper quire, \$.80
- 191 "Pellucid" Tracing Paper. Medium. (Same as No. 176):**
 20 x 27 inchesper quire, \$1.00
- 192 French Vegetable Tracing Paper:**
 Cap13 x 17 inches.....per quire, \$.90
 Medium16 x 20 inches.....per quire, 1.25
 Royal19 x 25 inches.....per quire, 2.00
 Imperial22 x 28 inches.....per quire, 2.50
- 193 Crane's Bond Paper:**
- | | Thin
No. 16 | Med.
No. 18 | Heavy
No. 21 | Ex. Heavy
No. 25 |
|--|----------------|----------------|-----------------|---------------------|
| Medium .....16 x 21 inches..per quire, | \$1.10.. | \$1.15.. | \$1.20.. | \$1.30 |
| Royal .....19 x 24 inches..per quire, | 1.20.. | 1.25.. | 1.30.. | 1.50 |
| Super Royal ..19 x 30 inches..per quire, | 1.40.. | 1.45.. | 1.50.. | 1.65 |
| Imperial .....21 x 33 inches..per quire, | 1.75.. | 1.80.. | 2.00.. | 2.50 |
- 194 India Proof Paper. For Wood Engravers' use:**
 13 x 44 inches...per bundle of 96 sheets, \$3.50....per doz. \$.50
- 195 Gelatine or Glass Paper. Extremely transparent. Medium thickness:**
 17 x 21 inches.....per dozen, \$3.00.....per sheet, \$.25
- 195¼ Frisket Paper. Medium. For Illustrator's Use.**
 19 x 24 inches.....per dozen, \$1.50.....per sheet \$.18
- 195½ Frisket Paper. Thin. For Illustrator's Use.**
 19 x 24 inches.....per dozen, \$1.50.....per sheet \$.18
- 195¾ Frisket Knives. For cutting Friskets. Steel blade encased in wood, pencil shape:**
 Sharpened, each, \$.45.....Not sharpened, each, \$.35
- 195A Rubber Cement. Best Quality. For pasting friskets on photographs.**
 Put up in tin cans with screw caps.
 Quarts, \$1.50.....Pints, \$.75.....½ Pints, \$.37
- 195B Clemon's Salted Paper:**
 18 x 22 inches.....per ream, \$37.50.....per dozen \$1.00
- 195C Artist's Transfer Papers. For transferring designs. Best Quality:**
 Black, Blue, Purple, Yellow or Graphite.
 25 x 38 inches..per 100 \$17.50,..per dozen \$2.50,..per sheet \$.25
 17 x 27 inches..per 100 10.00..per dozen 1.50,..per sheet .15

For Pastes and Mucilage see Nos. 6885-6906.

Prepared Blue Process Papers and Cloth

For making copies (by sun or electric light) from tracings, in white lines on blue ground.

Directions.—The sensitized paper is exposed under the tracing to the light, either in a printing frame or over a flat board covered with a felt cushion and a heavy plate glass. As it is very essential that the tracing and the sensitized paper should be in good contact, a printing frame is preferred. After correct exposure to the light, the paper is put into a water bath, which will at once develop clear white lines on a blue ground (the paper should be handled in dim light only).

***Extra Quick Blue Print Paper.** Any of the Papers or Cloths Nos. 196-213, can when so ordered, be prepared with an Extra Quick Printing Solution, which for electric printing, or for sun printing during the winter months, is a decided advantage. Paper thus prepared prints in about 10 minutes in cloudy weather, whereas the regular solution would require a longer exposure. When ordering, please mention whether extra quick or regular solution is desired.

Superior Blue Process Papers, quality "A". Being specially sensitized according to the best formulas, give excellent results and retain their sensitiveness longer than any other papers. They are therefore highly recommendable for export, advertising, prints from photographic negatives, and such other work where a first-class blue print is required.

196 "Superior A" Blue Process Paper. Parchment. Thin. Suitable for mailing:

	30 in.	36 in.	42 in.	54 in. wide
50 yard rolls.....	\$7.50.....	\$8.25.....	\$9.00.....	\$12.75
25 yard rolls.....	4.05.....	4.45.....	4.80.....	6.70
10 yard rolls.....	1.08.....	1.95.....	2.10.....	2.85

197 "Superior A" Blue Process Paper. Medium thick:

	30 in.	36 in.	42 in.	54 in. wide
50 yard rolls.....	\$7.50.....	\$8.25.....	\$9.00.....	\$12.75
25 yard rolls.....	4.05.....	4.45.....	4.80.....	6.70
10 yard rolls.....	1.08.....	1.95.....	2.10.....	2.85

198 "Superior A" Blue Process Paper. Heavy:

	30 in.	36 in.	42 in.	54 in. wide
50 yard rolls.....	\$9.00.....	\$9.75.....	\$10.50.....	\$14.25
25 yard rolls.....	4.80.....	5.20.....	5.55.....	7.45
10 yard rolls.....	2.10.....	2.25.....	2.40.....	3.15

Superior Blue Process Papers, Quality "B," Recommended for General Use

202 "Superior B" Blue Process Paper. Parchment. Thin. Suitable for mailing:

	30 in.	36 in.	42 in. wide
50 yard rolls.....	\$5.00.....	\$5.50.....	\$6.00
25 yard rolls.....	2.70.....	3.00.....	3.20
10 yard rolls.....	1.20.....	1.30.....	1.40

Sample of any of above sent on application. Complete sample book, 10c.

Prepared Blue Process Paper and Cloth—Continued

203 "Superior B" Blue Process Paper. Medium thick:

	30 in.	36 in.	42 in. wide
50 yard rolls.....	\$5 00.....	\$5.50.....	\$6.00
25 yard rolls.....	2.70.....	3.00.....	3.20
10 yard rolls.....	1.20.....	1.30.....	1.40

204 "Superior B" Blue Process Paper. Heavy:

	30 in.	36 in.	42 in. wide
50 yard rolls.....	\$6.00.....	\$6.50.....	\$7.00
25 yard rolls.....	3.20.....	3.50.....	3.70
10 yard rolls.....	1.40.....	1.50.....	1.60

210 "Fulton" Blue Process Cloth. Medium thick. Sensitized, indispensable for plans which are used out-of-doors, or which are subjected to a very rough handling:

	30 in.	36 in.	42 in.	54 in. wide
50 yard rolls.....	\$24.00.....	\$26.50.....	\$36.50.....	\$50.00
25 yard rolls.....	12.25.....	13.65.....	18.90.....	25.60
10 yard rolls.....	5.10.....	5.70.....	7.80.....	10.60

211 "Nassau" Blue Process Cloth. Thin. Sensitized:

	30 in.	36 in.	42 in. wide
50 yard rolls.....	\$30.80.....	\$33.25.....	\$43.50
25 yard rolls.....	15.75.....	17.10.....	22.20
10 yard rolls.....	6.50.....	7.00.....	9.30

Domestic Blue Process Papers

Suitable for Shop Prints.

212 Domestic Blue Process Paper. Thin:

	24 in.	27 in.	30 in.	36 in.	42 in.	54 in. wide
50 yard rolls.....	\$3.70.....	\$3.90.....	\$4.00.....	\$4.50.....	\$5.00.....	\$7.50
25 yard rolls.....	2.10.....	2.20.....	2.25.....	2.50.....	2.75.....	4.00
10 yard rolls.....	.95.....	1.00.....	1.05.....	1.10.....	1.20.....	1.70

213 Domestic Blue Process Paper. Medium thick:

	24 in.	27 in.	30 in.	36 in.	42 in.	54 in. wide
50 yard rolls.....	\$3.70.....	\$3.90.....	\$4.00.....	\$4.50.....	\$5.00.....	\$7.50
25 yard rolls.....	2.10.....	2.20.....	2.25.....	2.50.....	2.75.....	4.00
10 yard rolls.....	.95.....	1.00.....	1.05.....	1.10.....	1.20.....	1.70

Samples of any of above sent on application. Complete sample book, 10c.



Erasing Fluids

For making alterations on Blue Prints.

- 220 Oxaline Erasing Fluid. White:
 224 Oxaline Erasing Fluid. Red:
 226 Oxaline Erasing Fluid. Yellow:
 per Pint, \$1.50.....per ½ Pint, \$1.00
 per dozen bottles, \$1.50.....per bottle, \$.15
 230 Brown Print Erasing Fluid, for making altera-
 tions on negatives, per bottle.....\$.20

Unprepared Blue Process Papers and Cloth

- 296 "Superior A" Blue Process Paper. Unprepared. Thin:
 50 yard rolls.....30 in., \$3.20.....36 in., \$3.80.....42 in., \$4.20
 297 "Superior A" Blue Process Paper. Unprepared. Medium Thick:
 50 yard rolls.....30 in., \$4.00.....36 in., \$4.75.....42 in., \$5.25
 298 "Superior A" Blue Process Paper. Unprepared. Heavy:
 50 yard rolls.....30 in., \$6.00.....36 in., \$7.00.....42 in., \$8.00
 302 "Superior B" Blue Process Paper. Unprepared. Thin:
 50 yard rolls.....30 in., \$2.40.....36 in., \$2.70.....42 in., \$3.30
 303 "Superior B" Blue Process Paper. Unprepared. Medium Thick:
 50 yard rolls.....30 in., \$2.85.....36 in., \$3.30.....42 in., \$3.85
 304 "Superior B" Blue Process Paper. Unprepared. Heavy:
 50 yard rolls.....30 in., \$3.30.....36 in., \$4.20.....42 in., \$4.80
 310 "Fulton" Blue Process Cloth. Unprepared. Medium Thick:
 10 yard rolls..30 in \$2.40.....36 in \$2.70.....42 in \$3.80.....54 in 4.60
 311 "Nassau" Blue Process Cloth. Unprepared. Thin:
 10 yard rolls.....36 in., \$3.50.....42 in., \$4.20
 313 Domestic Blue Process Paper. Unprepared. Medium Thick:
 50 yard rolls.....30 in., \$2.10.....36 in., \$2.50.....42 in., \$3.00'

Samples of any of above sent on application. Complete sample book, 10c.



Various Copying Processes

Sun Printing of every description.

Blue Prints. White lines on a blue ground. The most serviceable for general use:

Blue Prints on paper.....per square foot, 2c.
 Blue Prints on cloth.....per square foot, 6c.
 No Prints made for less than 5c. Special rates for large quantities.
 Prices of sensitized papers and directions, see pages 15 and 16.

Black Prints. Dark lines on a light ground. Suitable for copies to be colored:

Black Prints on paper.....per square foot, 4c.
 Black Prints on cloth.....per square foot, 7c.
 No prints made for less than 10c.

Brown Prints. Negatives, white lines on a brown ground:

Positives, brown lines on a white ground:

Blue Prints from negatives produce blue lines on a white ground:

Negatives from tracings.....per square foot, 6c.
 Brown Positives from negatives.....per square foot, 7c.
 Brown Positives on cloth from negatives....per square foot, 12c.
 Blue Prints from negatives.....per square foot, 3c.
 Blue Prints on cloth from negatives.....per square foot, 7c.
 Negatives from Patent Office Drawings.....each, 15c.
 No Prints made for less than 10c.

Ink Prints. Perfectly black lines on a pure white ground. Made from a gelatine film without the use of water or chemicals, will therefore not shrink:

No. of copies of each tracing	1	2	3	4-11	12-25	26-100
On smooth paper....sq. ft.	.09	.07	.06	.05	.04¾	.04
On drawing paper....sq. ft.	.10	.08	.07	.06		
On No. 310 Cloth, up to 42 in. wide.....sq. ft.	.11	.09	.08	.07	.07	.06¾
On tracing cloth.....per square foot,						20c.

Prices for larger quantities or on 54 in. cloth on application.

Black Process Paper

385 Black Process Paper. Sensitized. With the aid of this paper very good black prints (black lines on a white ground) can be produced direct from the tracing. The manipulation is as simple as the blue process and requires nothing more than a plain water bath. No chemicals necessary. Instructions with every roll:

	30 in.	36 in.	42 in. wide
10 yard rolls.....	\$2.00	\$2.50	\$3.00

Brown Process Papers and Cloth

Brown Process Papers. Sensitized. Produce a negative (white lines on a dark ground). From this negative, positive copies (dark lines on a white ground), can be made. Or, with the aid of ordinary blue print paper, positives (blue lines on a white ground), can be produced from the same negative.

Directions for use.—Expose the tracing in the usual manner with the prepared paper under it. About two minutes' exposure in good sunlight is sufficient. Wash the print in plain water for about 15 minutes, then place in a water bath to which the Fixing Salt has been added. After leaving in this Fixing Bath for a few minutes, wash well in clear water and then hang print up to dry.

Fixing Bath consists of 1 oz. of Fixing Salt dissolved in one quart of water.

390 Brown Process Paper. Thin, for negatives and for positives which are to be mailed:

	30 in.	36 in.	42 in.	54 in. wide
50 yard rolls.....	\$8.40	\$9.55	\$10.70	\$19.25
10 yard rolls.....	1.75	2.00	2.25	4.00

391 Brown Process Paper. Medium Thick:

	30 in.	36 in.	42 in.	54 in. wide
50 yard rolls.....	\$8.40	\$9.55	\$10.70	\$19.25
10 yard rolls.....	1.75	2.00	2.25	4.00

395 Brown Process Cloth. Heavy:

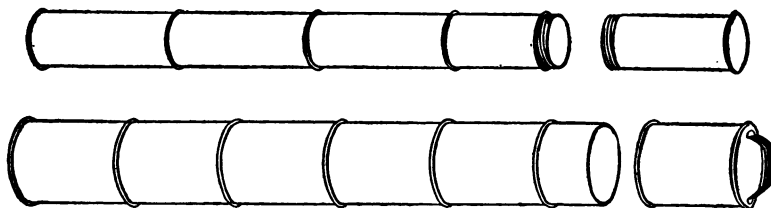
	30 in.	36 in.	42 in.	54 in. wide
10 yard rolls.....	\$4.00	\$4.50	\$5.75	\$9.50

397 Brown Process Cloth. Thin: 36 in. 42 in. wide
10 yard rolls.....\$5.50.....\$6.60

Fixing salts and directions with every roll.

398 Fixing Salt......per 1 pound box, \$.40.....per 4-ounce box, \$.15

Metal Tubes for Preserving Paper



Metal Tubes for Preserving Sun Print Papers, Tracing Cloth, Tracing Papers, etc.

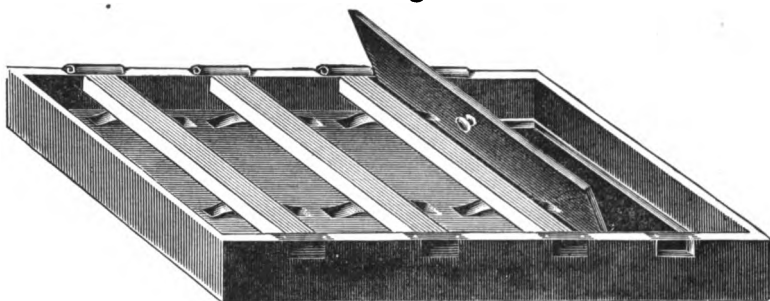
They are made of tin, with tightly fitting slip covers to exclude moisture, light or dust:

400 4 in. diameter, to hold 50 yard rolls of Blue Print Paper:
30 in., \$1.00.....36 in., \$1.10.....42 in., \$1.25

402 2½ in. diameter, to hold 10 yard rolls of Blue Print Paper:
30 in., \$.90.....36 in., \$.95.....42 in., \$1.00



Sun Printing Outfits.



525 Sun Printing Frames. Best Quality. Hardwood Frame. Strong, Durable Springs:

	Frame only without Glass or Felt Cushion	Complete with Plate Glass and Felt Cushion	Complete with Glass, Felt Cushion and Ballbearing Wheels attached to sides	Complete with Glass, Felt Cushion, Ballbearing Wheels and Track No. 685
20 x 24 in.	\$ 6.80.....	\$10.35		
24 x 30 in.	8.00.....	12.50		
30 x 42 in.	12.50.....	22.75.....	\$25.00.....	\$35.00
36 x 48 in.	17.00.....	33.90.....	36.90.....	54.90
36 x 60 in.	19.75.....	40.75.....	44.00.....	62.00
42 x 60 in.	24.75.....	49.00.....	53.00.....	71.00
42x72 in.	32.00.....	62.00.....	66.00.....	84.00

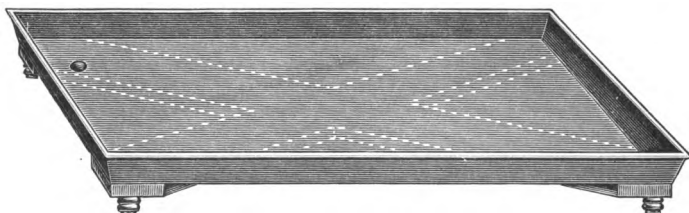
Above sizes denote clear printing space. Sizes of frames about 2 in. more each way.

550 Sun Printing Frames for Patent Office Drawings. Hardwood with Double Thick Glass and Felt Cushion:

11 x 16 in.....each, \$2.75.....16 x 20 in.....each, \$4.75

553 Felt for printing frames. Best quality. ¼ in. thick...per sq. ft., \$.40

555 Spring Clips. For hanging prints to dry.....per dozen, \$.25



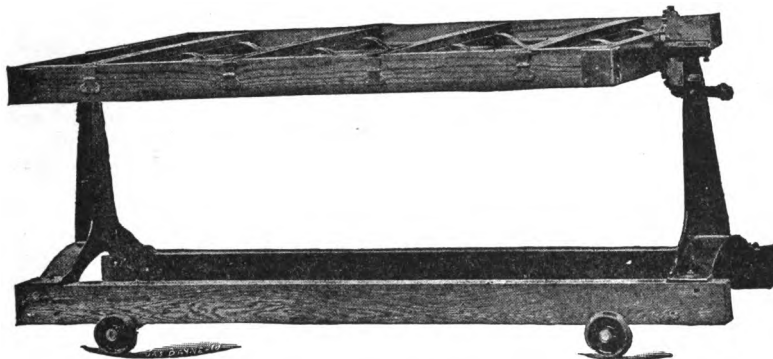
650 Metal Bath Trays, for developing blue or black prints. Best quality with Drain Pipe, Strong Wired Rim, and Hardwood Braces:

20 x 24 in. 24 x 30 in. 30 x 42 in. 36 x 48 in. 36 x 60 in. 42 x 60 in. 42 x 72 in.
Each, \$4.50....\$5.50....\$7.00....\$8.50....\$9.00....\$11.25....\$14.00

655 Plain Bath Trays for Frames No. 550:

12 x 17 in.each, \$2.00.....17 x 22 in.....each, \$2.50

Print Frames on Wheel Carriages.



These Carriages and Frames are made of hardwood and are substantial in construction. The Frame revolves in the standards, can be tilted to any angle, and by means of a notched wheel can be fastened in any desired position. A Frame which is much wider than the window can be swung through, and afterwards adjusted to the proper angle to catch the sunlight.

670 Printing Frame with polished Plate Glass and Cushion, complete with Frame on Carriage :

24x30	30x42	36x48	36x60	42x60	42x72
Each, \$32.60	\$44.25	\$58.20	\$68.00	\$75.00	\$89.25

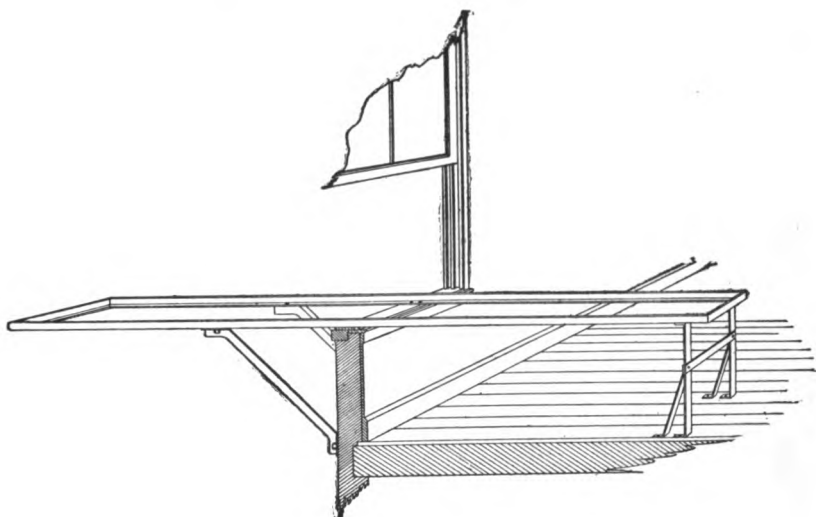
Wheel Carriages.

675 Wheel Carriages only, without Frames :

For Frames, sizes.....	24x30	30x42	Each, \$20.00
" " "	36x48 and larger		" 25.00



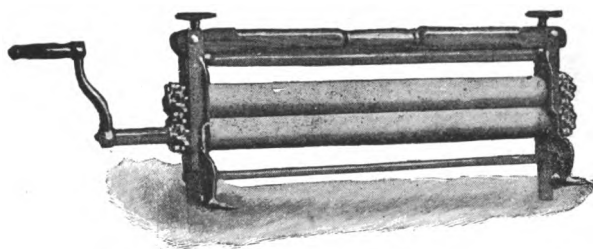
Track for Blue Print Frames.



This is a very practical track arrangement upon which cars may be run out of a window, carrying blue print frames for exposure. In ordering give distance from Floor to the top of Window Sill and Thickness of Wall.

685 Tracks for Frames and Cars, No. 670.....each, \$15.00

Blue Print Wringer.



The revolving Brass Roll guides the print as it passes through the wringer and prevents wrinkling. The frame is made of malleable **IRON**, thoroughly galvanized to prevent rusting. The rubber rolls are of the best quality, especially compounded to preserve the print and dry the paper evenly. A wringer of this kind will pay for its cost in a very short time by the saving of labor and time in drying blue prints. Rollers are 3 inches in diameter.

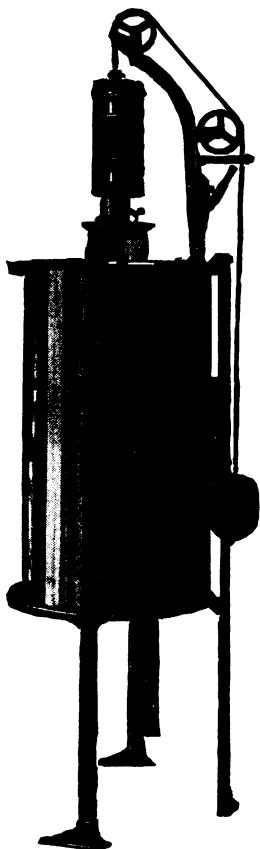
690 Blue Print Wringers :

	24 in.	30 in.	36 in.	38 in.	44 in.	48 in long
Each.....	\$32.00.....	\$40.00.....	\$45.00.....	\$47.00.....	\$50.00.....	\$55.00

Shaw Blue Print Machine

Non-Continuous.

A low priced apparatus for making Blue Prints, Black Prints, Brown Positives or Brown Negatives with a printing capacity up to 30" x 36".



CONSTRUCTION.

The machine consists of a half cylinder of heavy plate glass, set upright, and against which tracings and paper to be printed are firmly held during exposure by a heavy canvas curtain. In the center of the cylinder an arc lamp of high power travels from top to bottom of machine at a uniform rate; the speed variations necessary for the different tracings and papers being obtained by shifting regulator on dial at side of machine.

OPERATION.

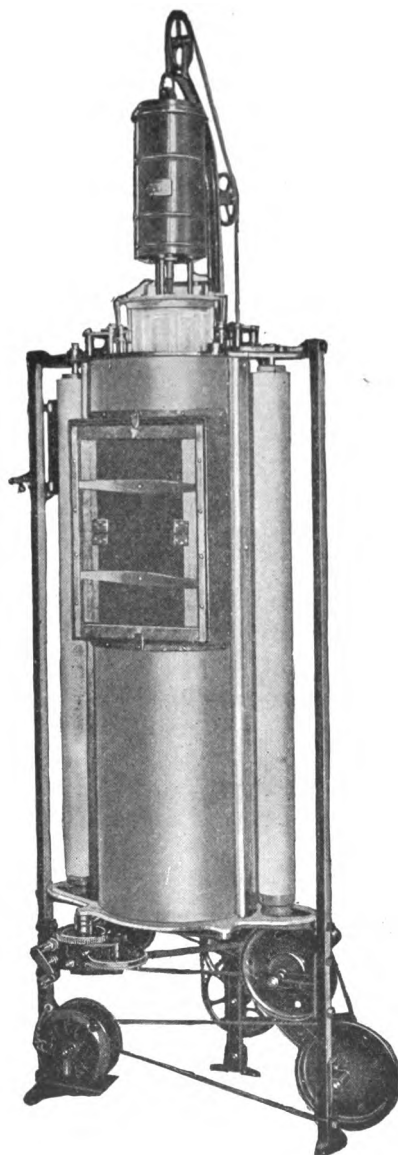
In loading the machine, the curtain is rolled back to the extreme right hand side, the tracings and sensitized paper being held in position against the surface of the glass; by then rolling curtain to left, over paper and tracings, the machine is ready to print. As soon as the lamp reaches the bottom of machine, and the prints have been sufficiently exposed, an automatic device throws the switch which controls the arc lamp, thus leaving it unnecessary for the operator to remain at the machine while same is in operation.

SHIPPING.

The machines are well made, are strong and durable. They are shipped completely assembled with the exception of lamp and lamp bracket, and can be set up ready for operation within a few minutes.

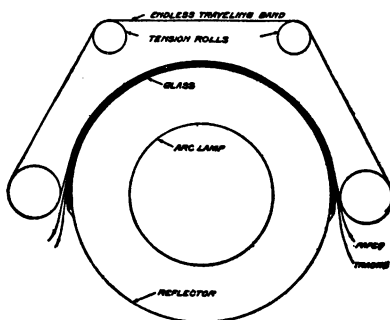
In ordering, it is necessary to state on what current the machine is to be operated, whether direct or alternating, and if the latter, the number of cycles. The shipping weight is about 200 pounds crated.

695 Shaw Non-Continuous Blue Printing Machine..... each \$98.00

Shaw Continuous Blue Print Machine.

Shaw Continuous Blue Print Machine.

The only low-priced Continuous Blue Print Machine on the market.
Uses but one Lamp.



CONSTRUCTION.

The machine consists of a half cylinder of heavy plate glass, set up-right, over which slides an endless canvas band driven by an electric motor, through worm gearing and double cone pulleys. Through the center an arc lamp, of special design and high power, travels continuously up and down at a uniform speed. The variations of speed, necessary for different cloths and papers, are obtained by shifting belt on cone pulley by means of a crank at side of machine. The sliding band makes perfect contact and the traveling lamp gives a uniform exposure making all prints of the same even color. The machine will print three lineal feet per minute, and prints of any length up to 42 in. wide can be made in one piece. The easy adjustment of the speed of this machine adapts it to printing Blue Prints, Black Prints, Brown Positives or Brown Negatives.

OPERATION.

The operation is exceedingly simple; the tracings and the cut sheets of the prepared paper are fed into the machine at the right hand side. As soon as one tracing disappears into the machine, insert the next one. The printed sheets and the tracings are taken out at the left hand side. On a basis of 10c. per K.W. hour the cost to operate will not exceed 15c. per hour.

The machines are well built, strong and durable, and are thoroughly inspected before shipping. Shipped complete with Lamp and Motor ready for use, with the exception of lamp and bracket, which can be put in place in a few minutes. Occupies a floor space of only 2½ feet square and stands 8 feet high.

When ordering, please state voltage, and whether direct or alternating current is used. If the latter, state the number of cycles.

700 Shaw Continuous Blue Printing Machine.....each \$265.00



Profile and Cross Section Papers and Cloth in Rolls.

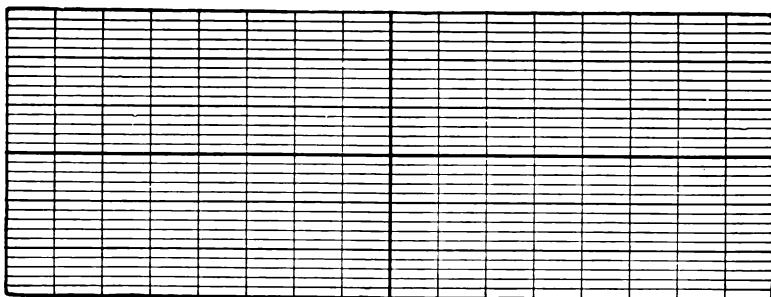


PLATE A—4 x 20 TO ONE INCH.

- 710 20 inches wide, orange or green.....roll of 50 yards, \$10.00.....yard, \$.24
- 712 20 inches wide, **mounted on Muslin**, orange or green,
roll of 20 yards, \$10.00.....yard, \$.60
- 714 20 inches wide, on transparent paper, printed in orange only,
roll of 50 yards, \$10.00.....yard, \$.24
- 716 20 inches wide, on **transparent cloth**, printed in orange only,
roll of 20 yards, \$12.50.....yard, \$.75
- 717 10 inches wide, orange or greenroll of 50 yards, \$6.25.....yard, \$.15
- 719 10 inches wide, **mounted on muslin**, orange or green,
roll of 20 yards, \$6.75.....yard, \$.40

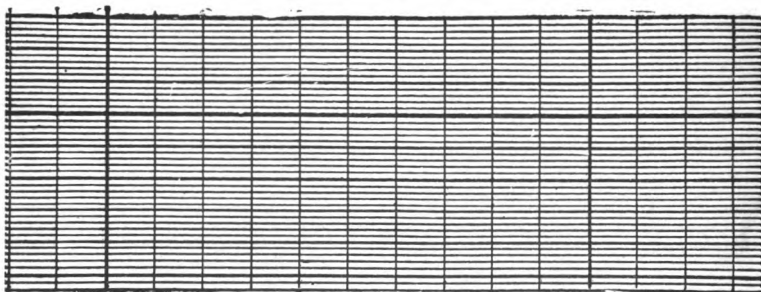
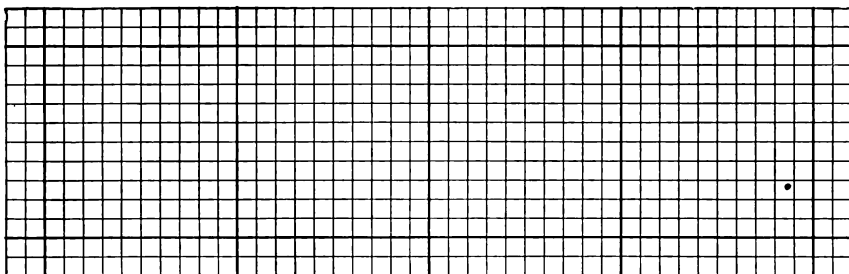


PLATE B—4 x 30 TO ONE INCH.

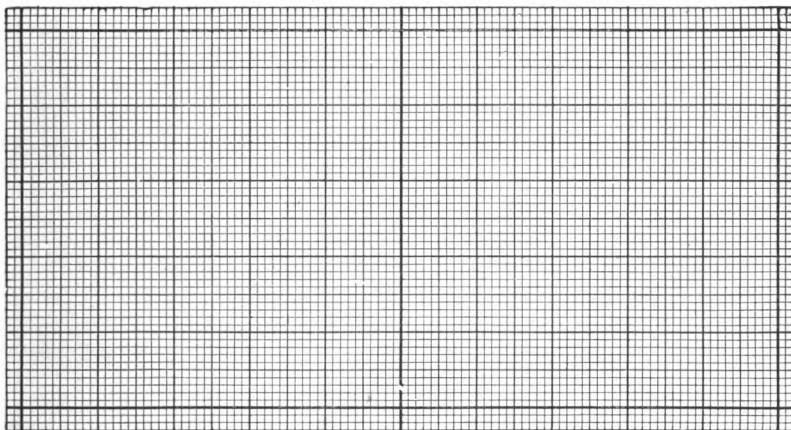
- 730 20 inches wide, orange or green.....roll of 50 yards, \$10.00.....yard, \$.24
- 732 20 inches wide, **mounted on muslin**, orange or green,
roll of 20 yards, \$10.00.....yard, \$.60
- 734 20 inches wide, on transparent paper, printed in orange only,
roll of 50 yards, \$10.00.....yard, \$.24
- 736 20 inches wide, on **transparent cloth**, printed in orange only,
roll of 20 yards, \$12.50.....yard, \$.75
- 737 9 inches wide, orange or green,.....roll of 50 yards, \$6.25.....yard, \$.15
- 739 9 inches wide, **mounted on muslin**, orange or green,
roll of 20 yards, \$6.75.....yard, \$.40

Profile and Cross Section Papers and Cloth in Rolls—Continued.



10 x 10 TO ONE INCH.

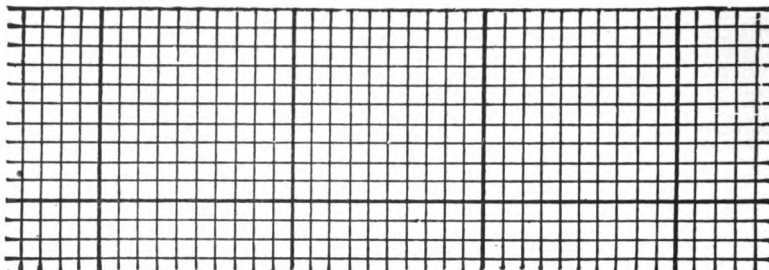
- | | |
|-----|--|
| 750 | 20 inches wide, orange or green.....roll of 50 yards, \$10.00.....yard, \$.24 |
| 752 | 20 inches wide, mounted on Muslin , orange or green,
roll of 20 yards, \$10.00.....yard, .60 |
| 754 | 20 inches wide, on transparent paper, printed in orange only,
roll of 50 yards, \$10.00... ..yard, .24 |
| 756 | 20 inches wide, on Transparent Cloth , printed in orange only,
roll of 20 yards, \$12.50.....yard, .75 |



MILLIMETER.

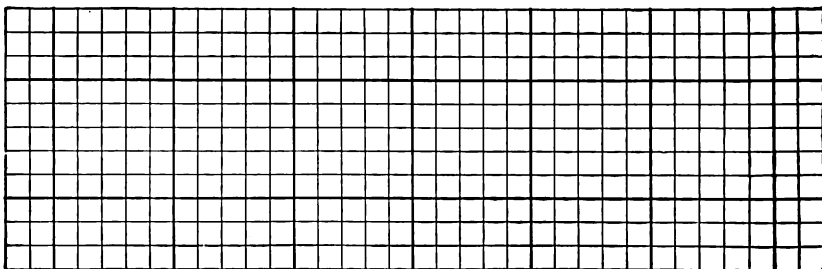
- | | |
|-----|---|
| 760 | 50 cm. wide, orange or green.....roll of 50 yards, \$10.00.....yard, \$.24 |
| 762 | 50 cm. wide, mounted on muslin , orange or green,
roll of 20 yards, \$10.00.....yard, .60 |
| 764 | 50 cm. wide, on Transparent Paper , printed in orange only,
roll of 50 yards, \$10.00.....yard, .24 |
| 766 | 50 cm. wide, on Transparent Cloth , printed in orange only,
roll of 20 yards, \$12.50.....yard, .75 |

Engraved Cross Section Papers in Sheets.



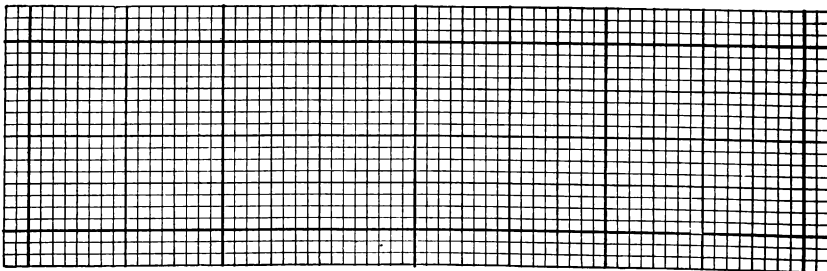
10 x 10 TO ONE INCH.

		Quire	Sheet
770	In sheets, engraving 16 x 20 in., orange or green.....	\$3.50	\$.20
772	In sheets, engraving 16 x 20 in., on transparent paper, printed in orange only.....	3.50	.20



8 x 8 TO ONE INCH.

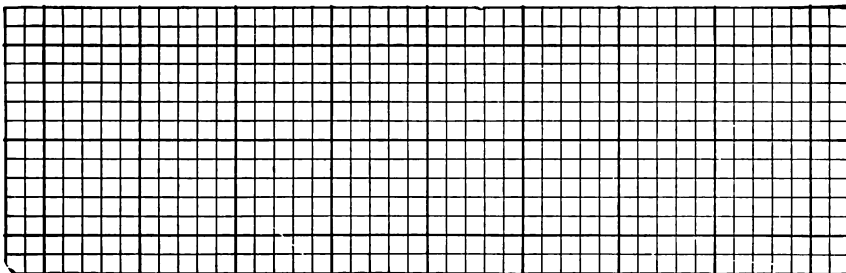
		Quire	Sheet
775	In sheets, engraving 16 x 20 in., orange or green.....	\$3.50	\$.20
777	In sheets, engraving 16 x 20 in., on transparent paper, printed in orange only.....	3.50	.20



16 x 16 TO ONE INCH.

		Quire	Sheet
780	In sheets, engraving 16 x 20 in., orange or green.....	\$3.50	\$.20
782	In sheets, engraving 16 x 20 in., on transparent paper, printed in orange only.....	3.50	.20

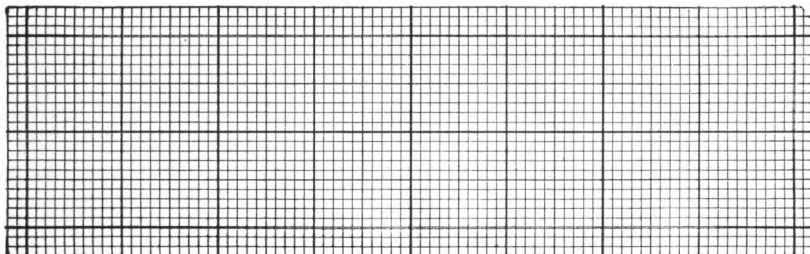
Engraved Cross Section Papers in Sheets—Continued



5 x 5 TO HALF INCH

		Quire	Sheet
785	Engraving 16 x 20 in., orange or green.....	\$3.50	\$.20
787	Engraving 16 x 20 in., on tracing paper, orange only....	3.50	.20

Constructors' Cross Section Papers



10 x 10 TO HALF INCH. EVERY FIFTH LINE HEAVY

		100 sheets	Quire
790	Engraving 5 x 7½ in., on Drawing Paper, Green only..	\$.90	\$.25
792	Engraving 7½ x 10 in., on Drawing Paper, Green only..	1.20	.30
794	Engraving 10 x 15 in., on Drawing Paper, Green only..	3.00	.75
796	Engraving 5 x 7½ in., on Tracing Paper, Orange only..	.90	.25
797	Engraving 7½ x 10 in., on Tracing Paper, Orange only..	1.20	.30
798	Engraving 10 x 15 in., on Tracing Paper, Orange only..	3.00	.75

12 x 12 to Half Inch. Every Sixth Line Heavy.

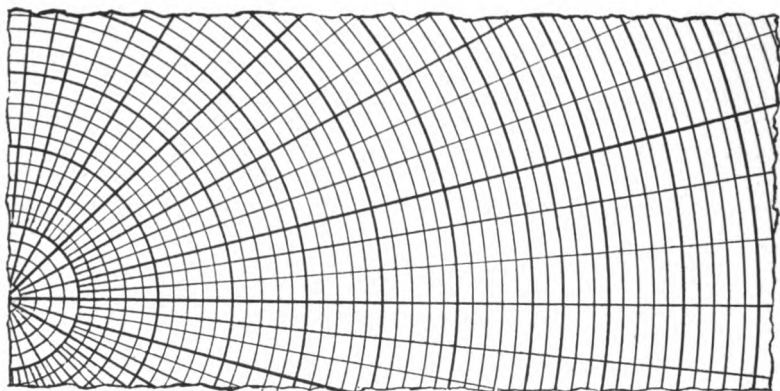
803	Engraving 7½ x 10 in., on Drawing Paper, Green only..	1.20	.30
806	Engraving 7½ x 10 in., on Tracing Paper, Orange only..	1.20	.30

Ruled Cross Section Paper, Each Inch Line Heavy.

		Ream	Quire
815	In sheets, 19 x 24 in., ruled in Blue, 10 x 10 to one inch	\$17.50	\$1.00
816	In sheets, 19 x 24 in., ruled in Blue, 8 x 8 to one inch	17.50	1.00
817	In sheets, 19 x 24 in., ruled in Blue, 5 x 5 to one inch	17.50	1.00
818	In sheets, 19 x 24 in., ruled in Blue, 12 x 12 to one inch	17.50	1.00
820	Topographical Paper, 400 Feet to One Inch, ruled in red and blue, in sheets 16 x 21 in.....	17.50	1.00

Samples of any of above sent on application.

Polar Co-ordinate Paper



		Quire	Sheet
850	Polar Co-Ordinate Paper , engraving $8 \times 11\frac{3}{4}$ in., on Tracing Paper in neutral tint for photo-engraving...	\$.50	\$.05
852	Polar Co-Ordinate Paper , engraving $8 \times 11\frac{3}{4}$ in., on Drawing Paper in neutral tint for photo-engraving...	.50	.05

Durand's Logarithmic Cross Section Paper

The principle on which this paper is based will be readily understood by those familiar with the slide rule. Any equation, in which the variable is of any power or of any root, may be plotted in a straight line. Printed on a 10 inch base, in orange ink. Size of engraving 10×10 in.

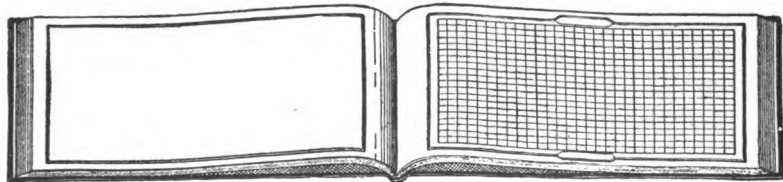
		dozen	sheet
855	Durand's Log. Cross Section Paper , on Tracing Paper..	\$.75	\$.08
856	Durand's Log. Cross Section Paper , on Drawing Paper..	.75	.08
	(furnished to order in blue ink at same price)		

Schroeder's Logarithmic Cross Section Paper

SIZE OF ENGRAVING 10×10 inches. Printed similar to Nos. 855 and 856, but has four logarithmic scales on a base of 5 inches each (two scales in each direction): Printed on bond paper in olive ink.

860	Schroeder's Logarithmic Cross Section Paper , doz. \$.75..sheet \$.08
-----	--

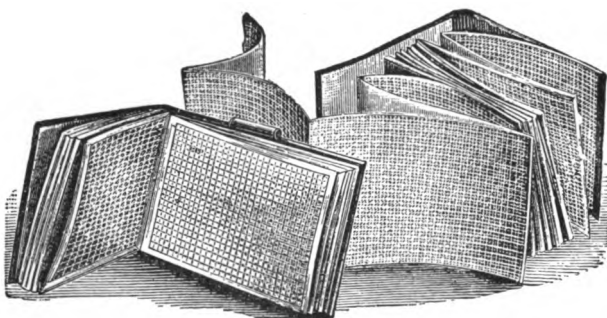
Dunham's Plat and Profile Book



Printed on a fine grade of paper and bound in flexible morocco cover. Size $4\frac{1}{4} \times 9\frac{1}{2}$ in. which makes it convenient for pocket use. Contains 28 profile pages. Plate B, engraving $3\frac{1}{4} \times 7\frac{1}{2}$ in. printed in green, and a blank page with margin $3\frac{1}{2} \times 8\frac{1}{4}$ in. suitable for plats, opposite each profile page. With index page and five pages of useful tables:

865	Dunham's Plat & Profile Book.....each, \$1 25
-----	---

Profile Books



Nos. 895-899

Nos. 875-890

These books are made up of continuous Profile Paper mounted on muslin, and are folded like a map so that two facing pages represent a section, or six thousand feet.

- 875** Plate A, 4 x 20 to one inch, printed in green. Size of book about 5½ x 8 in., bound in flexible morocco covers:

	12	25	50	100 miles
Each	\$2.00	\$3.20	\$5.20	\$9.40

- 880** Plate B, 4 x 30 to one inch, printed in green. Size of book about 4½ x 8 in., bound in flexible morocco covers:

	12	25	50	100 miles
Each	\$2.00	\$3.20	\$5.20	\$9.40

- 890** Metric Profile Books, printed in green. Size of book about 6½ x 8½ in., bound in flexible morocco covers:

	100	200 pages
Each	\$5.25	\$9.50

Not Continuous.

- 895** Plate A, 4 x 20 to one inch, printed in green. Size of book about 7 x 10 in., bound in stiff morocco covers:

	25	50	100 leaves
Each	\$1.75	\$2.25	\$3.00

- 897** Plate B, 4 x 30 to one inch, printed in green. Size of book about 5½ x 9½ in., bound in stiff morocco covers:

	25	50	100 leaves
Each	\$1.75	\$2.25	\$3.00

- 899** Metric, in Millimetres, printed in green. Size of book about 6½ x 8½ in., bound in stiff morocco covers:

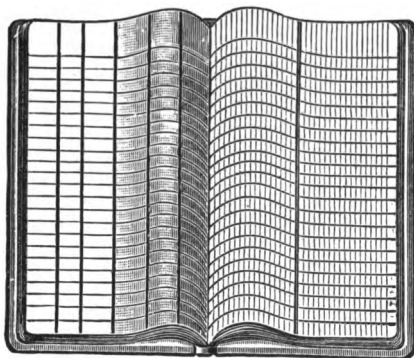
	25	50	100 leaves
Each	\$1.75	\$2.25	\$5.00



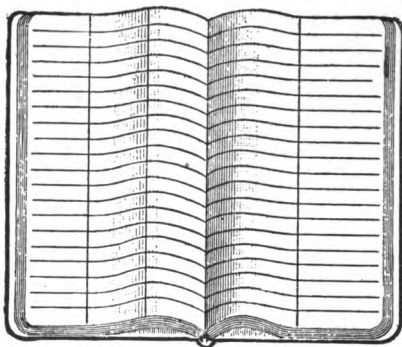
Field, Transit, Level and Cross Section Books

Bound in Leather with Round Corners.

Exceptionally Strong Binding.

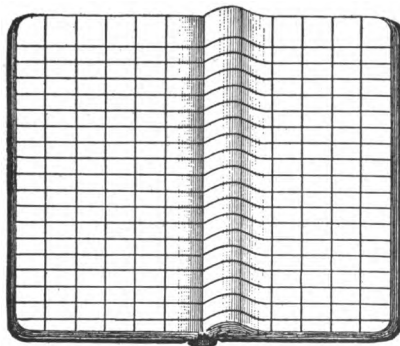


No. 900-901

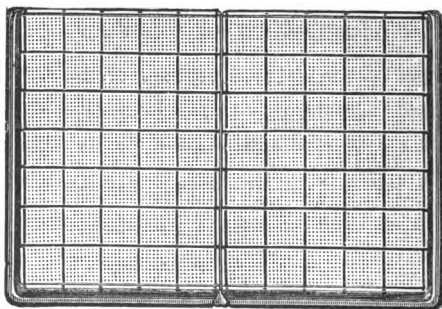


No. 910-911

900	Field Book, $4\frac{1}{2} \times 7\frac{1}{2}$ in., 80 leaves.....per doz.,	\$5.50	each, \$	.55
901	Field Book, $4\frac{1}{2} \times 7\frac{1}{2}$ in., 60 leaves.....per doz.,	5.00	each,	.50
910	Transit Book, $4\frac{1}{2} \times 7\frac{1}{2}$ in., 80 leaves.....per doz.,	5.50	each,	.55
911	Transit Book, $4\frac{1}{2} \times 7\frac{1}{2}$ in., 60 leaves.....per doz.,	5.00	each,	.50



No. 915-916



No. 920-922

915	Level Book, $4 \times 6\frac{1}{2}$ in., 80 leaves.....per doz.,	\$5.40	each, \$	.50
916	Level Book, $4 \times 6\frac{1}{2}$ in., 60 leaves.....per doz.,	4.50	each,	.45
920	Cross Section Books, $4\frac{1}{2} \times 7\frac{1}{2}$ in., 80 leaves..per doz.,	6.00	each,	.60
921	Cross Section Books, $5\frac{1}{2} \times 7\frac{1}{2}$ in., 80 leaves..per doz.,	7.00	each,	.70
922	Cross Section Books, $6\frac{1}{2} \times 8\frac{1}{2}$ in., 80 leaves..per doz.,	9.00	each,	.90

Special Books made to order at short notice.

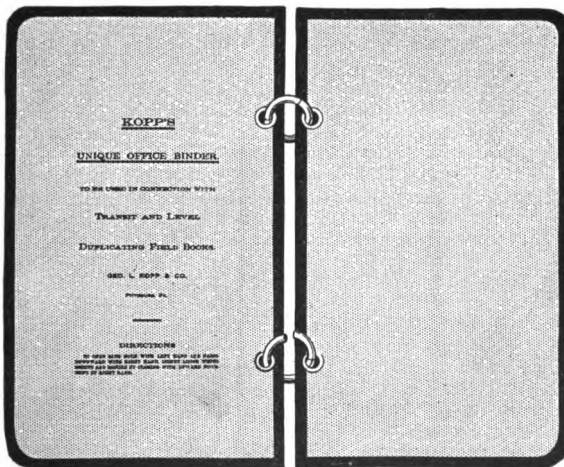
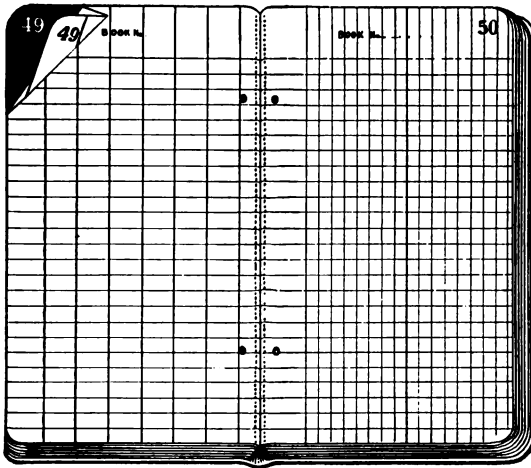
Field Book Pencil, see list of pencils.

Field Book Rule, see list of Surveyors' Accessories.

Kopp's Duplicating Field Book

Very popular with railways and other engineering operations, where the field parties are more or less distant from the office where the plotting is done. By making a single entry, it enables the engineering corps in the field to furnish the home office with a duplicate sheet of their proceedings each day. The originals are perforated and can be conveniently placed in the binder furnished with each book.

- 924 Kopp's Duplicating Field Book, $4\frac{5}{8} \times 7\frac{7}{8}$ inches, 80 numbered leaves and 80 duplicate leaves, per dozen, \$9.75.....each, \$.90
 Kopp's Office Recorder Binders, per dozen, \$3.00.....each, \$.30

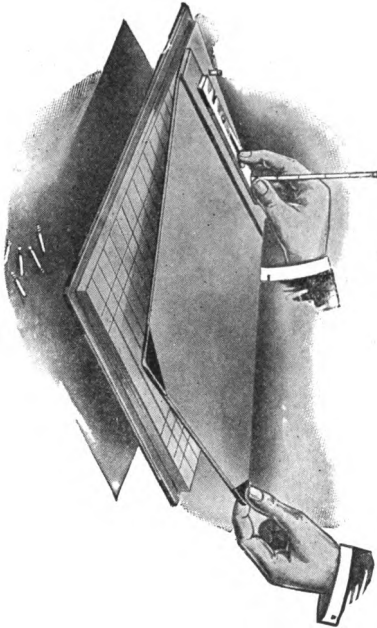


See pages 34 and 35 for Loose Leaf Field, Level, Transit and Cross Section Books.

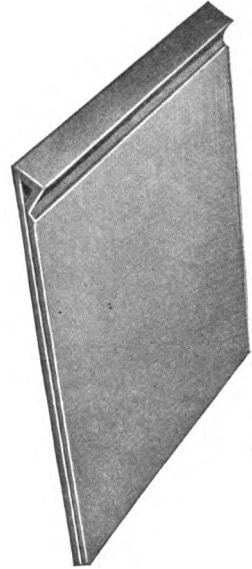


Loose Leaf

Field, Level, Transit and Cross Section Books



930



925

The Loose Leaf System having permeated all lines of business, is now also generally called for in the Engineering Profession, and we offer the following solution to this problem:

- I. **For Field Use**, a sheet holder which will rigidly hold from one to one hundred sheets of the required ruling. Made of strong board covers, bound in slate canvas, with concealed spring.
- II. **For Office Use**, a transfer binder to which the finished sheets are transferred for permanent record. Made of heavy binders board, bound in drab canvas with red leather corners. Sheets are instantly and securely fastened in the binder by pushing the metal wedge against the binding posts (see cut) which are made up of 4 sections, each one inch long, and can be built up as required.
- III. **Loose Sheets**, ruled on both sides in the regulation manner as in books Nos. 900-922.

There are so many advantages to a loose leaf system as applied to engineering notes that they are almost too numerous to mention; we cite, however, three of the principal ones:

- I. Does entirely away with the constant dread of loosing books containing valuable and very often irreplaceable notes.
- II. Ability to plot notes as fast as they are turned into the office, without waiting for the book, and ability to refer to any notes at any time, as the office record is always complete.
- III. Simplicity of arrangement, ultimate reduction of cost over bound books, and saving of space in the safe of wherever the notes are kept.

(Continued on next page)

Loose Leaf

Field, Level, Transit and Cross Section Books (Continued)

I. Sheet Holder

	Each
925 Sheet Holder, as described on page 34, to hold sheets $4\frac{1}{2} \times 7\frac{1}{2}$ in.,	\$.75
926 Same as No. 925, to hold sheets $8\frac{1}{2} \times 11$ inches.....	.90

II. Transfer Binder

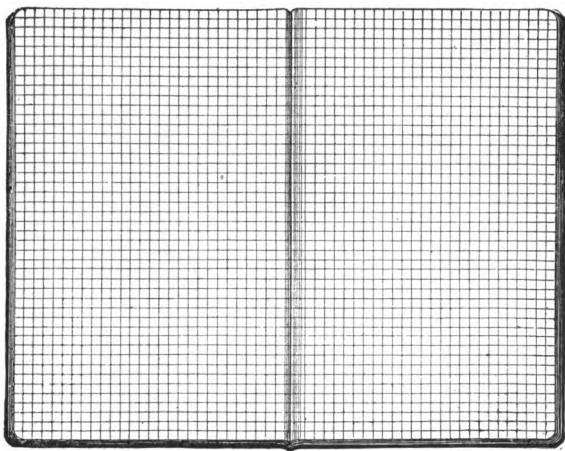
930 Transfer Binder, as described on page 34, to hold sheets $4\frac{1}{2} \times 7\frac{1}{2}$ inches	1.40
931 Same as No. 930, to hold sheets $8\frac{1}{2} \times 11$ inches.....	1.50

III. Loose Sheets

	Per 100	Per 1000
935 Field Book Sheets , ruling same as in Field Books Nos. 900 and 901, $4\frac{1}{2} \times 7\frac{1}{2}$ inches, ruled both sides and punched for binder.....	\$.35	\$3.00
936 Same as No. 935, but $8\frac{1}{2} \times 11$ inches.....	.65	6.00
938 Level Book Sheets , ruling same as in Level Books Nos. 910 and 911, $4\frac{1}{2} \times 7\frac{1}{2}$ inches, ruled both sides and punched for binder .....	.35	3.00
939 Same as No. 938, but $8\frac{1}{2} \times 11$ inches .....	.65	6.00
941 Transit Book Sheets , ruling same as in Transit Books Nos. 915 and 916, $4\frac{1}{2} \times 7\frac{1}{2}$ inches, ruled both sides and punched for binder .....	.35	3.00
942 Same as No. 941, but $8\frac{1}{2} \times 11$ inches .....	.65	6.00
944 Cross Section Book Sheets , ruling same as in Cross Sec- tion Books Nos. 920-922, $4\frac{1}{2} \times 7\frac{1}{2}$ inches, ruled both sides and punched for binder.....	.35	3.00
945 Same as No. 944, but $8\frac{1}{2} \times 11$ inches.....	.65	6.00

Sheets $8\frac{1}{2} \times 11$ inches can be used in the field in the smaller sheet holder No. 925 by folding sheets in half, and afterwards transferred, opened, to the proper size binder No. 931. By using this combination, the two pages of notes on the same work will be on the same side of the sheet and adjacent to each other, whereas in using the small size sheet they will be on opposite pages.

"Fulton" Figuring Books



- 960 "Fulton" Figuring Books.** 60 leaves. Ruled on a fine grade of manilla paper in blue squares of 5 to the inch. Bound in flexible press board covers. Recommended for tabulations, figures and estimates of all kinds:

9 x 12 inches.....per dozen, \$4.00.....each, \$.40
6 x 9 inches.....per dozen, 2.00.....each, .20

- 961 "Fulton" Figuring Books.** 60 leaves. Same as No. 960, but ruled in squares of 4 to the inch:

9 x 12 inches.....per dozen, \$4.00.....each, \$.40
6 x 9 inches.....per dozen, 2.00.....each, .20

"Fulton" Figuring Pads

- 965 "Fulton" Figuring Pads.** 100 sheets each. Ruled on a fine grade of manilla paper in blue squares of 5 to the inch. Padded on top and left-hand side:

9 x 12 inches.....per dozen, \$4.00.....each, \$.40
6 x 9 inches.....per dozen, 2.00.....each, .20

- 966 "Fulton" Figuring Pads.** 100 sheets. Same as No. 965, but ruled in squares of 4 to the inch:

9 x 12 inches.....per dozen, \$4.00.....each, \$.40
6 x 9 inches.....per dozen, 2.00.....each, .20

Richter's Precision Instruments

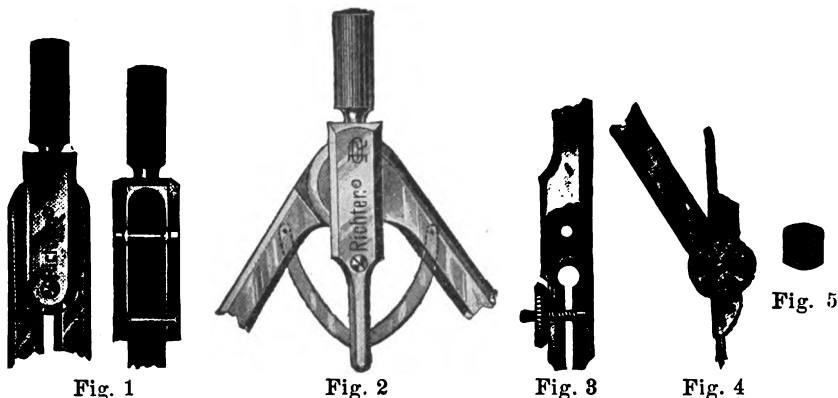


Fig. 1

Fig. 2

Fig. 3

Fig. 4

Fig. 5

Originated by E. O. Richter, in 1892 and embody features which had never before been used in the manufacture of Drawing Instruments.

I. They are all made absolutely to gauge, all parts being interchangeable.

II. Materials used; Very finest quality of Rolled German Silver and English Steel

III. The improved construction of the various joints and parts as described further on.

Not only have these instruments attained a world-wide fame and sale on account of their quality, but have been closely imitated by a majority of the competing makers. This latter fact is in itself a concession of the merits and the most sincere flattery of the original Richter System.

Only one quality is made, the cheaper grades as listed are made of the same high grade materials and with the same care as the most expensive ones. The difference in price is caused by the more or less complicated construction.

Compasses and Dividers.

The foremost requirement in compasses and dividers intended for high grade work is an absolutely true and steady joint. The Richter Joint, by reason of its construction, can never become loose or work unevenly; it permits of exact adjustment and can be oiled readily. Fig. 1 shows the plain joint, while Fig. 2 shows the joint with the Straightening Device.


The cheeks of the compasses, which are centrically connected by a bipartite pivot showing a rounded head on either side, are enclosed by a fork carrying corresponding cavities on either side of its inner surface to receive the rounded heads of the pivots.

The ends of the fork are drawn together by a screw passing between the legs of the compasses, by means of which the tension can be minutely regulated.

The cheeks of the compasses are thus held together, not by the natural and therefore transient elasticity of the fork, but by the permanent pressure exerted by the screws.

This construction warrants a true and smooth action for all times. The Straightening Device forces the handle to remain in a position central to the legs. See Fig. 2.

The manner in which pen, pencil and needle parts are held in place in their socket is very simple but effective, so that the parts will never become shaky.

All Genuine Richter Instruments stamped with Trade Mark 

Richter's Precision Instruments—Continued

The socket is split and the two sides drawn together by a T bolt screw which clamps the inserted part firmly. See Fig. 3.

All compasses are supplied with needle point parts, which when inserted convert the compasses into perfect dividers.

One of the legs is provided with a needle point held in a split reversible sleeve (See Fig. 4) so that plain or shouldered needles can be used. The points can always be adjusted to a position perpendicular to the paper without any noticeable shortening of the leg, and permit the use of the compasses for larger radii than with the old style compasses.

The improved Dividers are fitted with movable Round Steel Points kept in place by means of set screws and offer great advantages over any other known system.

I. The fineness of the round points permits of the greatest possible exactness in taking and transferring measurements, leaving on the paper only such slight traces or marks as may be desirable.

II. The sharpening of Divider Points is entirely dispensed with, as they are simply thrown away when worn or damaged and replaced by new ones at a very slight cost. Reserve points are supplied with each set of instruments and can be inserted without the slightest difficulty.

The compasses and dividers are of the flat round type, a cross section of the legs being shown in Fig. 5. Corners and sharp edges are avoided as much as possible to make the handling more pleasant. In order not to obstruct the view in drawing, all hairspring and set screws are placed between the legs of the dividers and compasses.

As mentioned before, all parts are absolutely interchangeable. A pen or pencil part of one compass will fit exactly into another of the same size. Therefore broken or lost screws or parts can easily be replaced by mail. This we mention particularly as the repairing of instruments not made to gauge and not interchangeable has always been a source of annoyance to users of drawing instruments.

Ruling Pens.

The Ruling Pens are made from the finest quality of English Steel especially hardened. Lateral motion of the screws is entirely overcome by the use of T bolt screws. The screws move freely and can adjust themselves to the position of the blades. All Ruling Pens have neat metal handles.

Spring Bow Instruments.

Spring Bow Instruments Nos. 1200-1225 are of a new construction which has the advantage that the tension of the shanks remains nearly constant for any spread, which is not the case in the old style flat spring Bows, which are therefore not listed, but can be supplied if so desired.

The threads of the adjusting screws are all cut very deep and coarse, especially those with the center screw adjustment, to insure quick motion and to avoid stripping of the threads.

All Genuine Richter Instruments stamped with Trade Mark





Richter's Ruling Pens

With neat Japanned Aluminum Handles.

Illustrations 2/3 size.



- | | | |
|-------|---|------|
| 1000R | Ruling Pen, 4½ in. upper blade with spring.....each, \$ | .95 |
| 1001R | Ruling Pen, 5 in. upper blade with spring.....each, | .95 |
| 1002R | Ruling Pen, 5½ in. upper blade with spring.....each, | .95 |
| 1003R | Case containing Ruling Pens Nos. 1000R, 1001R, 1002R..each, | 3.30 |




- Extra Fine Quality, made of extra tough and hardened material.
- | | | |
|-------|---|------|
| 1005R | Ruling Pen, 4½ in. upper blade with spring.....each, \$ | 1.35 |
| 1006R | Ruling Pen, 5 in. upper blade with spring.....each, | 1.35 |
| 1007R | Ruling Pen, 5½ in. upper blade with spring.....each, | 1.35 |
| 1008R | Case containing Ruling Pens Nos. 1005R, 1006R, 1007R..each, | 4.50 |

Pens with Cross Joints



By pressing the thumb against loose blade, same turns aside and Pen can be easily cleaned and then reset to original position.

- | | | |
|-------|---|------|
| 1010R | Ruling Pen, 4½ in. upper blade with spring.....each, \$ | 1.35 |
| 1011R | Ruling Pen, 5 in. upper blade with spring.....each, | 1.35 |
| 1012R | Ruling Pen, 5½ in. upper blade with spring.....each, | 1.35 |
| 1013R | Case containing Ruling Pens Nos. 1010R, 1011R, 1012R..each, | 4.50 |


All Genuine Richter Instruments stamped with Trade Mark 

Richter's Ruling Pens—Continued

Illustrations 2/3 size.

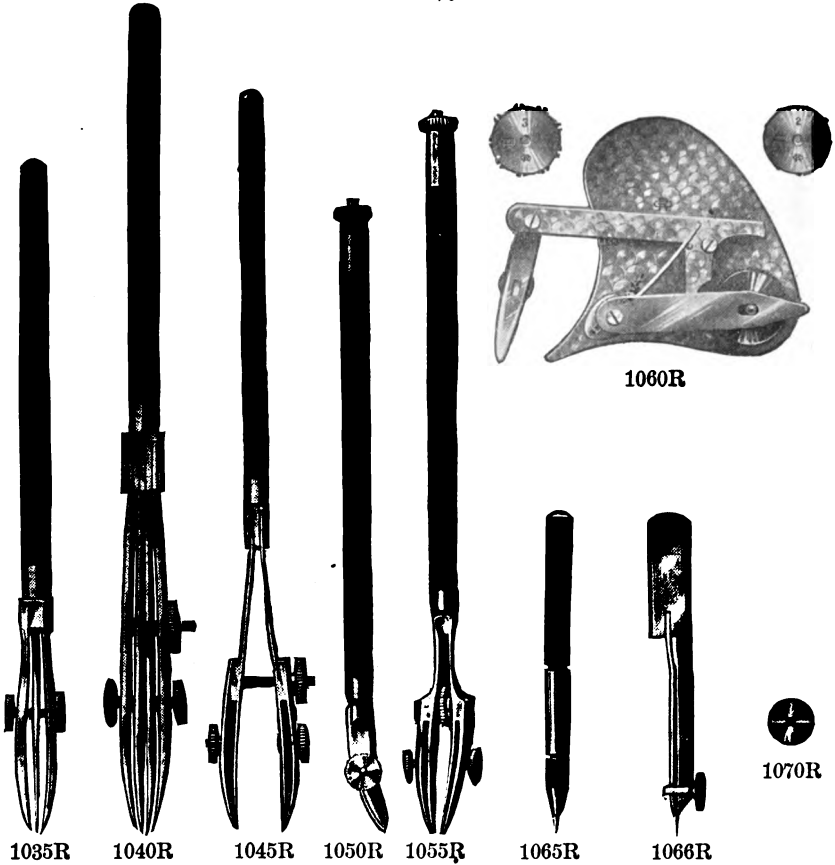


- | | | | | | | | | |
|-------|---|--------|-------|---|------------|-------|---|------------|
| 1015R | 1016R | 1017R | 1020R | 1022R | 1025R | 1026R | 1030R | 1031R |
| 1015R | Swedish Ruling Pen, 6 in. Aluminum handle, Small....each, | \$1.26 | 1016R | Swedish Ruling Pen, 6 in. Aluminum handle, Medium...each, | 1.20 | 1017R | Swedish Ruling Pen, 6 in. Aluminum handle, Large....each, | 1.35 |
| 1020R | Ruling Pen, 5½ in., Metal handle, with Pricker.....each, | 1.35 | 1022R | Pocket Ruling Pen, 5 in., For Pocket Use.....each, | 1.20 | 1025R | Knife Pen, 5 in., for Fine Lines. Easy to sharpen. Jap. Aluminum handle | each, 1.05 |
| 1026R | Knife Pen, 5 in., same as No. 1025R. With Cross Joint...each, | 1.45 | 1030R | Dial Pen, 5½ in., with Graduated Thumb Screw, Japanned. Aluminum handle | each, 1.60 | 1031R | Dial Pen, 5½ in. Same as No. 1030R, with Cross Joint...each, | 2.15 |

All Genuine Richter Instruments stamped with Trade Mark 

Richter's Ruling Pens—Continued

Illustrations $\frac{2}{3}$ size.



1035R	Three-nib Ruling Pen, 5 in., for heavy lines., metal handle.	each \$1.60
1040R	Border Pen, 6 in., metal handle.....	" 2.65
1045R	Railroad Pen, 5¼ in., metal handle.....	" 2.15
1050R	Curve Pen, 4½ in., metal swivel handle with lock nut....	" 1.45
1055R	Curve Railroad Pen, 5¼ in., metal swivel handle with lock nut	" 4.00
1060R	Dotting Instrument with 3 wheels in case.....	" 3.20
	Extra Wheels of 32 different designs.....	" .30
1065R	Pricker, 2¾ in. Will fit any sewing needle.....	" .55
1066R	Pricker, 2¾ in., flat, to prevent rolling off the drawing board	" .65
1070R	Center Tack, used to avoid making large holes in the paper	" .12

All Genuine Richter Instruments stamped with Trade Mark



Richter's Dividers

Illustration 2/3 size.

Dividers With Plain Heads



- 1100R Plain Dividers, 4 in. with Detachable Steel Points....each, \$1.75
 1102R Plain Dividers, 5¼ in. with Detachable Steel Points....each, 1.85



- 1105R Hairspring Dividers, 4 in. with Detachable Steel Points, each, 2.55
 1107R Hairspring Dividers, 5¼ in. with Detachable Steel Points, each, 2.65

Dividers With Straightening Device



- 1110R Plain Dividers, 4 in. with Detachable Steel Points....each, \$2.15
 1112R Plain Dividers, 5¼ in. with Detachable Steel Points....each, 2.25



- 1115R Hairspring Dividers, 4 in. with Detachable Steel Points, each, \$2.95
 1117R Hairspring Dividers, 5¼ in. with Detachable Steel Points, each 3.05

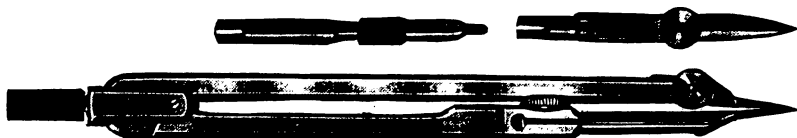
All Genuine Richter Instruments stamped with Trade Mark



Richter's Compasses

Illustrations 2/3 size.

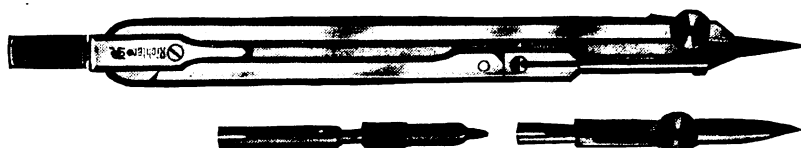
With Plain Heads



- 1150R** Compasses, 4 in., Detachable Steel Points, Pen and Pencil Pointseach, \$3.20

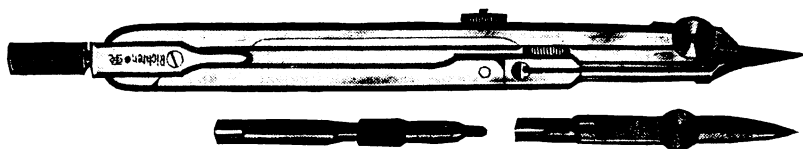
- 1152R** Compasses, 6 in., Detachable Steel Points, Pen and Pencil Pointseach, 3.45

Compasses With Straightening Device



- 1155R** Compasses, 4 in., Detachable Steel Points, Pen and Pencil Pointseach, \$3.60


- 1157R** Compasses, 6 in., Detachable Steel Points, Pen and Pencil Pointseach, 3.85



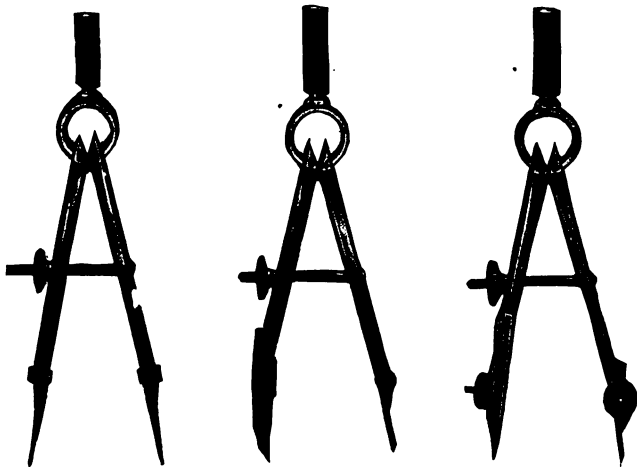
- 1160R** Hairspring Compasses, 6 in., with Detachable Steel Points, Pen and Pencil Points.....each, \$4.65

Any of above Compasses furnished with Cross Joint Pen Points, extraeach, .40

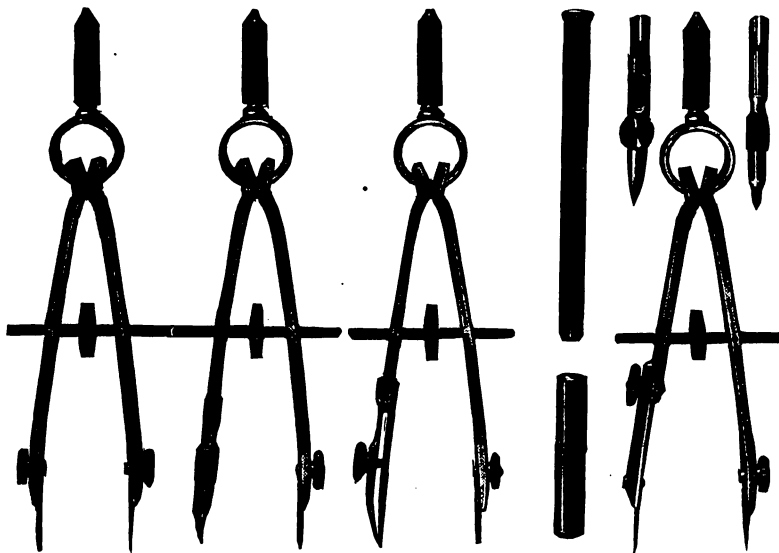
Lengthening Bars furnished with 6 in. Compasses when ordered, extraeach, .80

All Genuine Richter Instruments stamped with Trade Mark 


Richter's Bows, Shanks of German Silver to Prevent Rusting



- 1200R Bow Spacer, $3\frac{1}{2}$ in. Metal Handle.....each, \$2.25
 1201R Bow Pencil, $3\frac{1}{2}$ in. Metal Handle.....each, 2.25
 1202R Bow Pen, $3\frac{1}{2}$ in. Selfadjusting Center Pin, Metal Handle..each, 2.80
 1203R Set of Bows Nos. 1200R, 1201R, 1202R, in case.....each, 8.35



- 1210R Bow Spacer, $4\frac{1}{4}$ in. Metal Handle, Center Screw.....each, \$2.65
 1211R Bow Pencil, $4\frac{1}{4}$ in. Metal Handle, Center Screw.....each, 2.65
 1212R Bow Pen, $4\frac{1}{4}$ in. Metal Handle, Center Screw.....each, 3.30
 1213R Bows Nos. 1210R-1212R, Needles & Lead Box, in case..each, 9.80
 1215R Bow Pen and Pencil, $4\frac{1}{4}$ in., in case.....each, 4.80

All Genuine Richter Instruments stamped with Trade Mark 



Richter's Bow Instruments—Continued

Illustrations 2/3 size.

Shanks of Steel



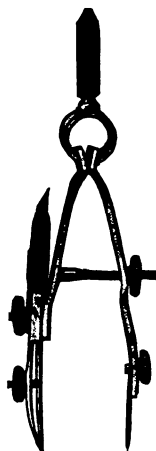
1220R



1221R



1222R



1225R

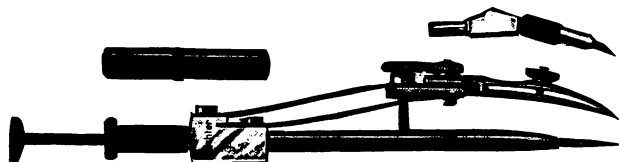
- | | | |
|-------|--|--------------|
| 1220R | Bow Spacer, 3½ in. Metal Handle..... | each, \$1.20 |
| 1221R | Bow Pencil, 3½ in. Metal Handle..... | each, 1.20 |
| 1222R | Bow Pen, 3½ in. Metal Handle..... | each, 1.85 |
| 1223R | Set of Bows Nos. 1220R, 1221R, 1222R, in case..... | each, 4.90 |
| 1225R | Combination Bow Pen and Pencil, 3½ in. Metal Handle, each, | 2.40 |

Richter's Self Adjusting Bow Instrument


Constructed with two parallel springs which hold the pen or pencil in a perpendicular position regardless of the size of the circle.



- | | | |
|-------|--|--------------|
| 1230R | Selfadjusting Bow Pen, 4½ in..... | each, \$2.80 |
| 1231R | Selfadjusting Bow Pen No. 1230R in case..... | each, 3.20 |

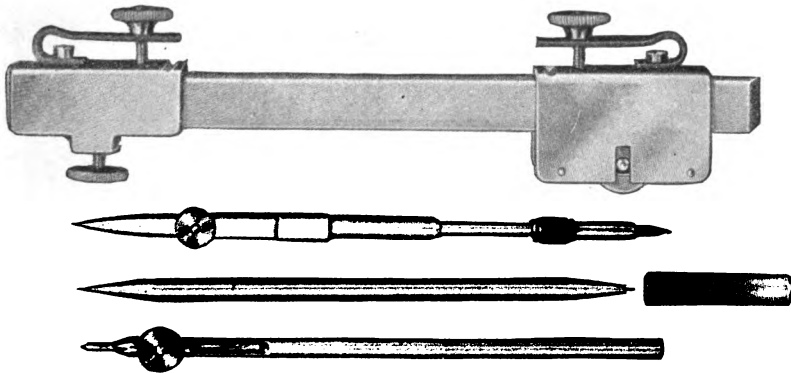


- | | | |
|-------|---|------------|
| 1235R | Selfadjusting Bow Pen and Pencil, 4½ in..... | each, 3.45 |
| 1236R | Selfadjusting Bow Pen and Pencil No. 1235R in case.. | each, 4.00 |
| | Any of above Bow Pens furnished with Cross Joints,
extra | each, .40 |

All Genuine Richter Instruments stamped with Trade Mark 

Richter's Beam Compasses

Simple but effective in construction. The slide carrying pen and pencil part is held in place by a strong, flat steel spring which presses a milled roller against the bar. To set the instrument, move the slide along the bar to about the desired position and make the fine adjustment by passing the thumb over the milled roller.



1240R Beam Compasses, with reversible pen and pencil, reversible center point, adjustable needle point and wooden bar 20 x ½ x ¼ inch, in case.....each, \$6.90

1242R Same as No. 1240R, but with Dotting Pen for Circles with 3 wheels of different patterns. In case.....each, 8.75

All Genuine Richter Instruments stamped with Trade Mark 

Richter's Beam Compass Bars

1244 Beam Compass Bars for Nos. 1240R and 1242R:

	30	36	42	48	60	72 in.
Each	\$.30	.35	.45	.50	.75	1.00

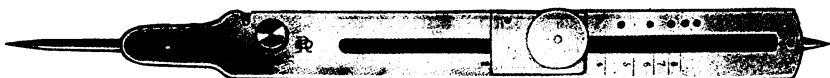


Richter's Proportional Dividers


Illustrations $\frac{2}{3}$ size.



- 1245R** Bisecting Compass, 7 in. with solid steel points. The following measures are fixed: $\frac{1}{8}$ and $\frac{1}{4}$, $\frac{3}{8}$ and $\frac{3}{4}$, $\frac{1}{2}$ and 1 incheach, \$4.00
- 1246R** Bisecting Compass No. 1245R in case.....each, 4.50



- 1248R** Proportional Dividers, $7\frac{1}{2}$ in. for lines and circles.....each, \$9.00
- 1249R** Proportional Dividers No. 1248R, in case.....each, 9.55

All Genuine Richter Instruments stamped with Trade Mark 

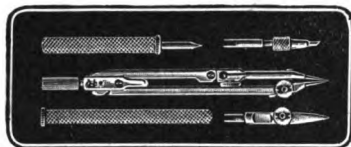
Separate Parts for Richter Instruments.

- Needle Point Leg for Compasses.....each, \$.40
- Pencil Point for Compasses.....each, .20
- Pen Point for Compasses.....each, .80
- Lengthening Barseach, .80
- Metal Handle for inserting pen and pencil points.....each, .20
- Combination Screw Driver and Lead Box, filled.....each, .25
- Plain or Shouldered Needle Points.....each, .10
- T Bolt Screws for Ruling Pens or Compasses.....each, .15
- Pencil Points for Bow Pen and Pencil No. 1235R.....each, .50
- Pen Points for Bow Pen and Pencil No. 1235R.....each, .80
- Screws for holding needle in compasses.....each, .25
- Nut and Thread for Spring Bow Instruments.....each, .25
- Nut and Thread for Center Screw Bow Instruments.....each, .70
- Reversible Pen and Pencil for Beam Compasses.....each, 1.10
- Center Point for Beam Compasses.....each, .80

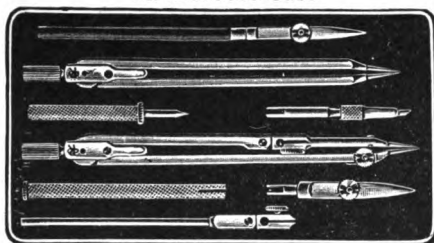
See page 61 for repairs of Drawing Instruments.

Richter's Instruments in Cases

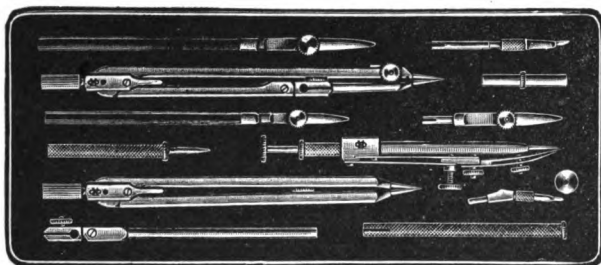
Each case supplied with Combination Screw Driver and Lead Holder, and with a Metal Handle, the hollow space of which holds several reserve Needle Points. This Handle serves for inserting Pen or Pencil Points so that either may be used as a separate instrument.



- 1250R { Compasses, 4 in., No. 1155R..... }
 { Metal Handle holding extra Needle Points..... } \$4.65
 { Metal Screw Driver holding extra Leads..... }
 In Morocco Case



- 1255R { Compasses, 6 in., No. 1157R..... }
 { Lengthening Bar for above..... } \$9.55
 { Plain Divider, 5¾ in., No. 1112R..... }
 { Ruling Pen, 5 in., No. 1006R..... }
 { Metal Handle holding extra Needle Points..... }
 { Metal Screw Driver holding extra Leads..... }
 In Morocco Case



- 1260R { Compasses, 6 in., No. 1157R..... }
 { Lengthening Bar for above..... } \$16.45
 { Hairspring Divider, 5¾ in., No. 1117R..... }
 { Selfadjusting Bow Pen and Pencil, 4½ in., No. 1235R.... }
 { Ruling Pen, 5 in., No. 1006R..... }
 { Ruling Pen, 5½ in., No. 1007R..... }
 { Center Tack No. 1070R..... }
 { Metal Handle holding extra Needle Points..... }
 { Metal Screw Driver holding extra Leads..... }
 In Pocket Book Case

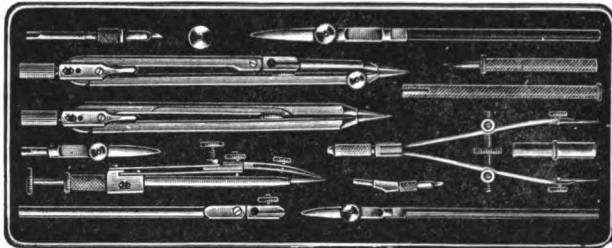
All Genuine Richter Instruments stamped with Trade Mark





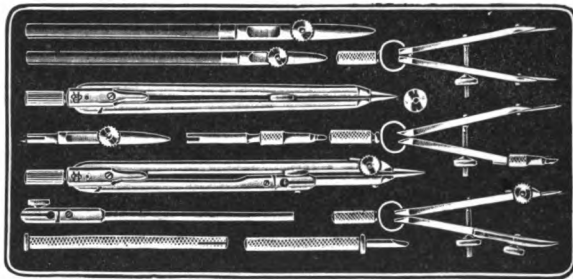
Richter's Instruments in Cases

Illustrations 1/3 size




1265R	{	Compasses, 6 in., No. 1157R.....	\$19.50
		Lengthening Bar for above.....	
		Hairspring Divider, 5¾ in., No. 1117R.....	
		Bow Spacer, 4¼ in., No. 1210R.....	
		Selfadjusting Bow Pen and Pencil, 4½ in., No. 1235R....	
		Ruling Pen, 5 in., No. 1006R.....	
		Ruling Pen, 5½ in., No. 1007R.....	
		Center Tack, No. 1070R.....	
		Metal Handle holding extra Needle Points.....	
		Metal Screw Driver holding extra Leads.....	

In Pocket Book Case



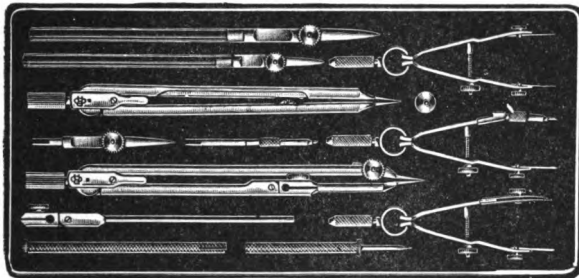
1270R	{	Compasses, 6 in., No. 1157R.....	\$20.70
		Lengthening Bar for above.....	
		Hairspring Divider, 5¾ in., No. 1117R.....	
		Bow Spacer, 3½ in., No. 1200R.....	
		Bow Pencil, 3½ in., No. 1201R.....	
		Bow Pen, 3½ in., No. 1202R.....	
		Ruling Pen, 5 in., No. 1006R.....	
		Ruling Pen, 5½ in., No. 1007R.....	
		Center Tack, No. 1070R.....	
		Metal Handle holding extra Needle Points.....	
		Metal Screw Driver holding extra Leads.....	

In Pocket Book Case

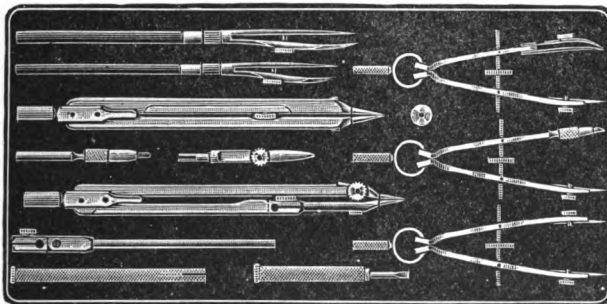
All Genuine Richter Instruments stamped with Trade Mark 

Richter's Instruments in Cases


Illustrations 1/3 size



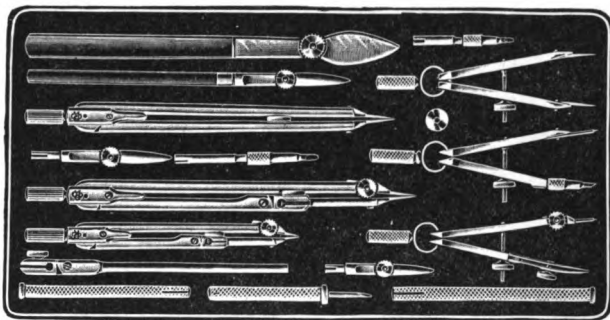
1275R	{	Compasses, 6 in., No. 1157R.....	}	\$17.95
		Lengthening Bar for above.....		
		Hairspring Divider, 5¾ in., No. 1117R.....		
		Bow Spacer, 3½ in., No. 1220R.....		
		Bow Pencil, 3½ in., No. 1221R.....		
		Bow Pen, 3½ in., No. 1222R.....		
		Ruling Pen, 5 in., No. 1006R.....		
		Ruling Pen, 5½ in., No. 1007R.....		
		Center Tack, No. 1070R.....		
		Metal Handle holding extra Needle Points.....		
		Metal Screw Driver holding extra Leads.....		
		In Pocket Book Case		



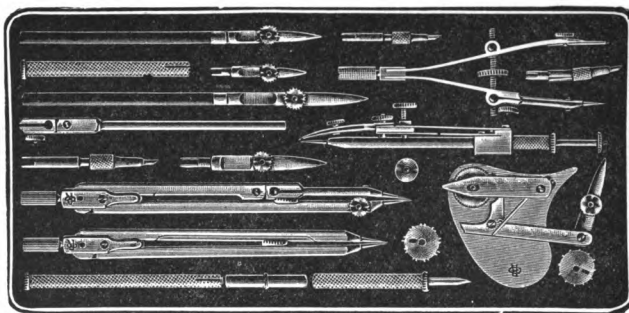
1280R	{	Compasses, 6 in., No. 1157R.....	}	\$22.25
		Lengthening Bar for above.....		
		Hairspring Divide; 5¾ in., No. 1117R.....		
		Bow Spacer, 4¼ in., No. 1210R.....		
		Bow Pencil, 4¼ in., No. 1211R.....		
		Bow Pen, 4¼ in., No. 1212R.....		
		Ruling Pen, 5 in., No. 1006R.....		
		Ruling Pen, 5½ in., No. 1007R.....		
		Center Tack, No. 1070R.....		
		Metal Handle holding extra Needle Points.....		
		Metal Screw Driver holding extra Leads.....		
		In Pocket Book Case		

All Genuine Richter Instruments stamped with Trade Mark 

Richter's Instruments in Cases



1285R	Compasses, 6 in., No. 1157R.....	\$24.95
	Lengthening Bar for above.....	
	Compasses, 4 in., No. 1155R.....	
	Hairspring Divider, 5¾ in., No. 1117R.....	
	Bow Spacer, 3½ in., No. 1200R.....	
	Bow Pencil, 3½ in., No. 1201R.....	
	Bow Pen, 3½ in., No. 1202R.....	
	Ruling Pen, 5 in., No. 1006R.....	
	Swedish Ruling Pen, Large, No. 1017R.....	
	Center Tack No. 1070R.....	
	Metal Handle holding extra Needle Points.....	
	Metal Screw Driver holding extra Leads.....	
	In Pocket Book Case	



1290R	Compasses, 6 in., No. 1157R.....	\$24.15
	Lengthening Bar for above.....	
	Hairspring Divider, 5¾ in., No. 1117R.....	
	Bow Pen and Pencil, 4¼ in., No. 1215R.....	
	Selfadjusting Bow Pen and Pencil, 4½ in., No. 1235R....	
	Ruling Pen, 5 in., No. 1006R.....	
	Ruling Pen, 5½ in., No. 1007R.....	
	Dotting Instrument No. 1060R.....	
	Center Tack No. 1070R.....	
	Metal Handle holding extra Needle Points.....	
	Metal Screw Driver holding extra Leads.....	
	In Pocket Book Case	

All Genuine Richter Instruments stamped with Trade Mark




Richter's Instruments in Cases

Illustrations $\frac{2}{3}$ size.



1292R	{	Compasses, 6 in. No. 1157R	}	\$37.10
		Lengthening Bar for above		
		Hairspring Divider, $5\frac{3}{4}$ in. No. 1117R		
		Bow Pen and Pencil, $4\frac{1}{4}$ in. No. 1215R		
		Beam Compasses, Pen and Pencil Points, and Dotting attachment for circles with 3 wheels		
		Dotting Instrument No. 1060R		
		Ruling Pen, $4\frac{1}{2}$ in. No. 1005R		
		Ruling Pen, 5 in. No. 1006R		
		Ruling Pen, $5\frac{1}{2}$ in. No. 1007R		
		Selfadjusting Bow Pen and Pencil, $4\frac{1}{2}$ in. No. 1235R		
		Pricker No. 1065R		
		3 Center Tacks, No. 1070R		
		Metal Handle holding extra Needle Points		
		Metal Screw Driver holding extra Leads		

In Fine Polished Black Walnut Case with Lock and Key.


All Genuine Richter Instruments stamped with Trade Mark 

Richter's Instruments in Cases

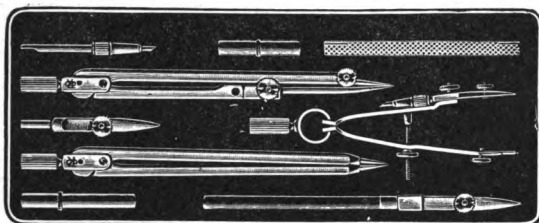


- 1294R {
- Compasses, 6 in., No. 1157R, with Lengthening Bar.
 - Compasses, 4 in., No. 1155R.
 - Hair Spring Divider, $5\frac{1}{4}$ in., No. 1117R.
 - Plain Dividers, Nos. 1110R and 1112R.
 - Bisecting Compass, 7 in., No. 1240R.
 - Folding Divider, 3 in., when folded.
 - Bow Spacer, $4\frac{1}{4}$ in., No. 1210R.
 - Self-adjusting Bow Pen and Pencil, $4\frac{1}{2}$ in., No. 1235R.
 - Beam Compasses, with center point, reversible pen and pencil and Dotting Attachment for circles with 6 different wheels.
 - Ruling Pens Nos. 1005R, 1006R and 1007R.
 - Dial Pen, $5\frac{1}{2}$ in., No. 1030R. Curve Pen, $4\frac{1}{2}$ in., No. 1050R.
 - Cross Hatching Pen, 5 in., metal handle.
 - Wedge Pen, metal handle.
 - Shading Pen, 5 in., metal handle, with push screw.
 - Border Pen, 6 in., No. 1040R. Railroad Pen, $5\frac{1}{4}$ in., No. 1045R.
 - Dotting Instrument, No. 1060R, with 6 different wheels.
 - Cross Section Liner with 10 in. Wooden Straight Edge.
 - Pricker, No. 1065R. 3 Center Tacks, No. 1070R.
 - Measure Marker for marking c/m and m/m.
 - Metal Handle, Needle Points. Metal Screw Driver, extra Leads.

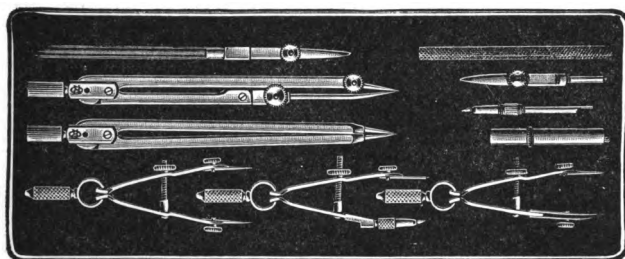
In Fine Polished Black Walnut Box, each \$74 20.

All Genuine Richter Instruments Stamped With Trade Mark 

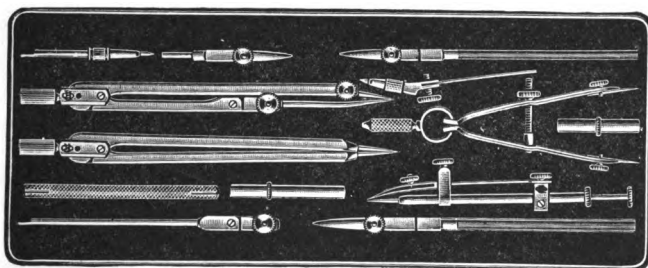
Richter's Instruments, "Industria" Pattern



- 1350R { Compasses, 6 in. Pen and Pencil Points.....
Plain Divider, 5¾ in.....
Bow Instruments, 4¾ in. reversible Pen and Pencil
Ruling Pen, 5 in. Metal Handle.....
Metal Handle for Pen and Pencil Parts; Lead Box.. } In case, \$9.55



- 1355R { Compasses, 6 in. Pen and Pencil Points.....
Plain Divider, 5¾ in.....
Bow Spacer, Bow Pen, Bow Pencil, Metal Handle.
Ruling Pen, 5 in. Metal Handle.....
Metal Handle for Pen and Pencil Parts; Lead Box.. } In case, \$10.85

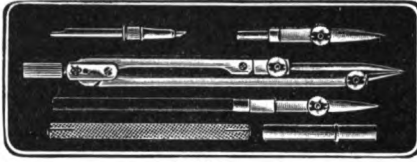


- 1360R { Compasses, 6 in. Pen and Pencil Points and
Lengthening Bar
Plain Divider, 5¾ in.....
Bow Spacer, 4¾ in. Metal Handle.....
Selfadjusting Bow Pen and Pencil, 4 in.....
Ruling Pen, 5 in. Metal Handle.....
Ruling Pen, 5½ in. Metal Handle.....
Metal Handle for Pen and Pencil Parts; Lead Box.. } In case, \$12.75

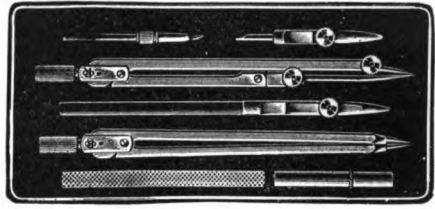
All Genuine Richter Instruments stamped with Trade Mark 



Richter Instruments, "Union" Pattern



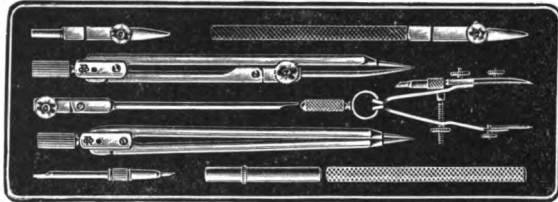
1400R



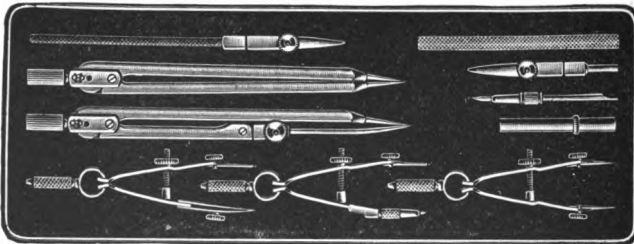
1405R

- 1400R { Compasses, 6 in. Pen and Pencil Points, Adjustable Needle Point
Ruling Pen, 5 in. Metal Handle
Metal Handle for Pen and Pencil Parts; Lead Box... } In case, \$3.60

- 1405R { Compasses, 6 in. Pen and Pencil Points, Adjustable Needle Point
Plain Divider, 6 in.
Ruling Pen, 5 in. Metal Handle
Metal Handle for Pen and Pencil Parts; Lead Box... } In case, \$4.90



- 1410R { Compasses, 6 in. Pen and Pencil Points, Adjustable Needle Point and Lengthening Bar
Plain Divider, 6 in.
Bow Instrument, 3½ in. Reversible Pen and Pencil...
Ruling Pen, 5 in. Metal Handle
Metal Handle for Pen and Pencil Points; Lead Box... } In case, \$8.50

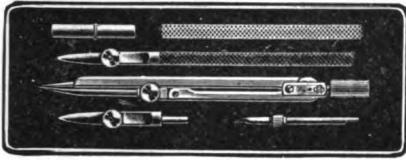


- 1415R { Compasses, 6 in. Pen and Pencil Points, Adjustable Needle Point
Plain Divider, 6 in.
Bow Spacer, 3½ in. Metal Handle
Bow Pencil, 3½ in. Metal Handle
Bow Pen, 3½ in. Metal Handle
Ruling Pen, 5 in. Metal Handle
Metal Handle for Pen and Pencil Parts; Lead Box... } In case, \$9.70

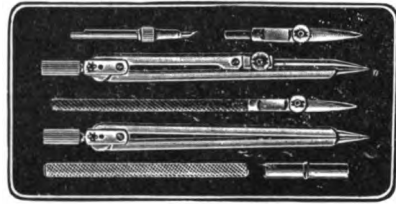
All Genuine Richter Instruments stamped with Trade Mark



Richter's Instruments, "Schola Pattern"

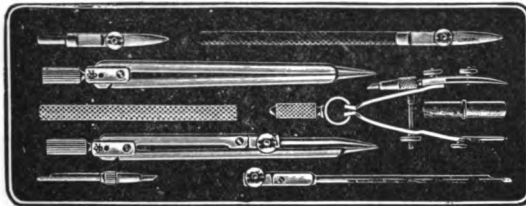


1450R

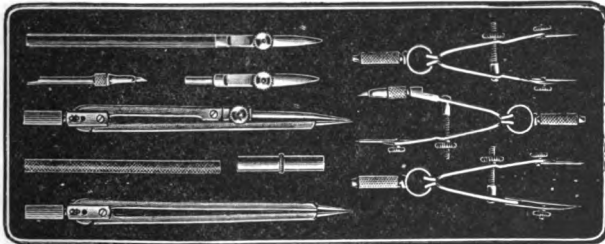


1454R


- 1450R { Compasses, 5 in., with pen and pencil points....
Ruling Pen, $4\frac{3}{4}$ in., metal handle..... } in case, \$1.95
Metal Handle for Pen and Pencil Parts, Lead Box
- 1451R Set No. 1450R, Instruments of Brass.....in case, \$1.55
- 1454R { Compasses, 5 in., with pen and pencil parts.....
Plain Divider, 5 in..... } in case, \$2.65
Ruling Pen, $4\frac{3}{4}$ in., metal handle.....
Metal Handle for Pen and Pencil Parts, Lead Box
- 1455R Set No. 1454R, Instruments of Brass.....in case, \$2.25



- 1458R { Compasses, 5 in., with pen and pencil parts and
lengthening bar
Plain Divider, 5 in..... } in case, \$6.10
Bow Instrument, $3\frac{1}{2}$ in., reversible pen and pencil
Ruling Pen, $4\frac{3}{4}$ in., metal handle.....
Metal Handle for Pen and Pencil Parts, Lead Box
- 1459R Set No. 1458R, Instruments of Brass.....in case, \$5.20



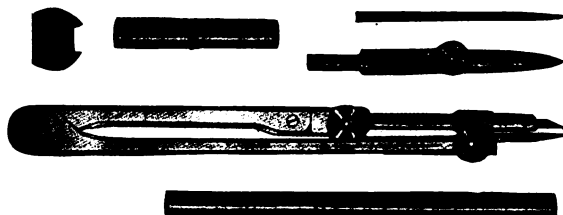
- 1460R { Compasses, 5 in., with pen and pencil parts.....
Plain Divider, 5 in..... } in case, \$7.70
Bow Spacer, Bow Pencil, Bow Pen, Metal Handle
Metal Handle for Pen and Pencil Parts, Lead Box
- 1461R Set No. 1460R, Instruments of Brass.....in case, \$6.45

All Genuine Richter Instruments stamped with Trade Mark 

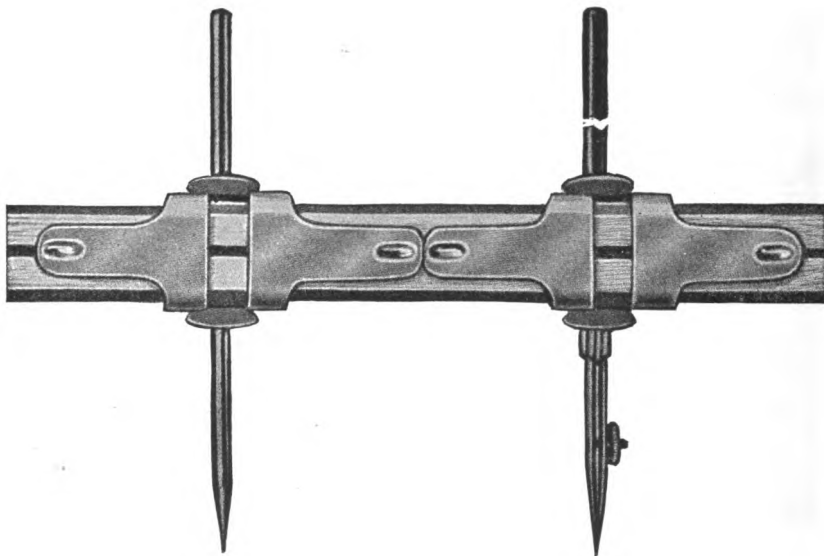


Richter's Instruments, "Schola Pattern"

Illustrations $\frac{2}{3}$ size.



- 1463R** Brass Compasses, $4\frac{1}{8}$ inch, with pen and pencil parts and adjustable steel point, metal handle for inserting pen and pencil, lead box and key.....each, \$.95
- 1464R** Brass Compasses No. 1463R, in case.....each, 1.20
- 1465R** Brass Compasses same as No. 1463R, with fixed steel point instead of adjustable center point.....each, .70
- 1466R** Brass Compasses No. 1465R, in case.....each, .95

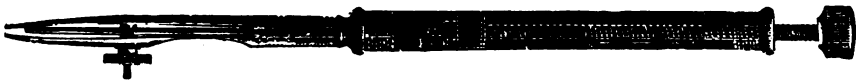


- 1468R** Beam Compasses, Brass, with center point and pen, bar 40 inches longeach, \$1.60

Miscellaneous Instruments

Fountain Ruling Pen.

Illustrations $\frac{3}{4}$ size.



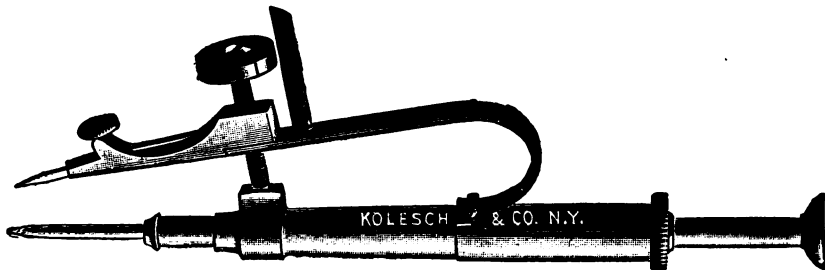
Although many Fountain Ruling Pens have been in the market during recent years, this is really the first of its kind which is perfect. There are no valves or springs of any kind to get out of order or wear out, in fact the very simplicity of this pen makes it a success. It consists of a German silver tube through which a piston rod passes, and which expels the ink into the pen proper by simply turning the screwhead to the right. If the feeding tube should become clogged with ink, a steel cleaning rod, furnished with each pen, serves to clean it. Simple directions for use with each pen.

- | | | |
|------|--|--------------|
| 1470 | Improved Fountain Ruling Pen, $5\frac{1}{2}$ in., spring to upper blade, with cleaning rod | each, \$3.50 |
| 1471 | Fountain Ruling Pen No. 1470, in vest pocket case..... | each, 4.00 |
| | Extra Ruling Pens for above | each, 1.00 |
| | New Washers for above..... | each, .10 |
| | Cleaning Rod, for above..... | each, .40 |

Lithographer's Selfadjusting Bow Instrument.

For Drawing on Wax or Stone

Illustrations full size.



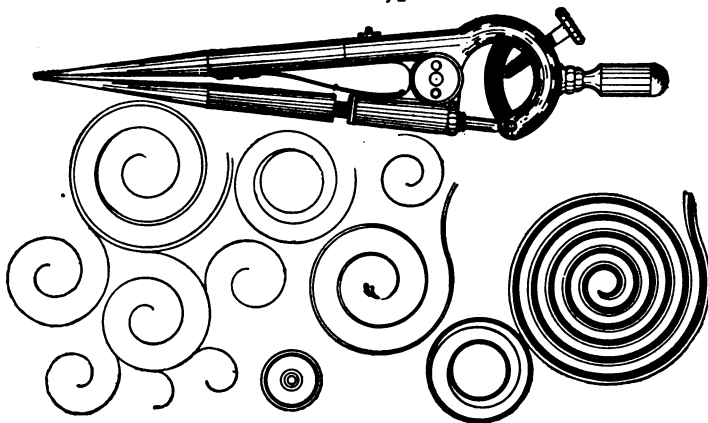
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|------|--|--------------|
| 1475 | Lithographer's Selfadjusting Bow Instrument, made of Rolled German Silver with Steel Point, Needle Point fitted with hardened Steel Needle. By removing Steel Needle and inserting a piece of lead, can be used as a Bow Pencil. With graduated thumb screw, divided into 20 parts to a complete revolution. Three revolutions equal $\frac{1}{8}$ in..... | each, \$6.25 |
|------|--|--------------|



Miscellaneous Instruments—Continued

Spirograph.

Illustration $\frac{1}{2}$ size.



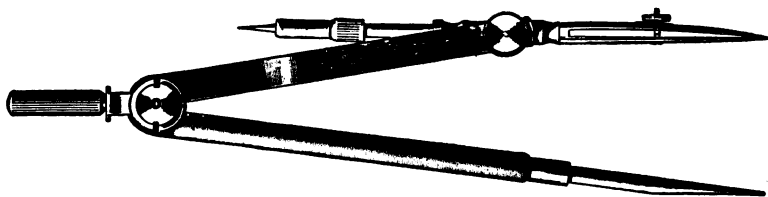
- 1480 "Spirograph," A new instrument for drawing the different forms of the Volute or Spiral. To draw Spirals use the double point and force same well into the drawing board and turn carefully so as not to cause any irregularity in the curves by jerking or changing the grasp on the instrument. When properly used, will save days of labor on the most intricate work, and the spirals will all be true spirals with a constantly changing volute.

Being adjustable, the styles of spirals can be modified to suit the designer; there being no limit to the number of spirals that can be produced. Well made of the best material, very simple in construction, and not difficult to use.

Furnished with Pen, Pencil and Needle Point, also an Extra Leg with greater pitch to the thread for producing wider variations in the spiral. This leg can also be used as a handle for the Pen Point making a complete Ruling Pen. If desired can be used as a Common Divider or Compass and can be very rapidly adjusted for different radii without removing the Needle Point from the paper.

In neat morocco case.....each, \$7.00

Combination Compass.



- 1485 Combination Compass, $5\frac{1}{2}$ in. Nickel Plated, with reversible pen and pencil points, with lead box and key, in cloth covered sheatheach, \$.50

Repairs of Drawing Instruments

For the accommodation of our customers, we have made arrangements with a trained instrument maker to repair such parts of instruments which are liable to get out of order, or which through constant use may from time to time need regrinding, re-adjusting, etc., and give below a list of repairs which mostly occur.

Sharpening Ruling Pens.....	\$.15
Grinding and Sharpening Ruling Pens.....	.25
Sharpening and Polishing Ruling Pens.....	.30
Grinding, Sharpening and Polishing Ruling Pens.....	.40
Re-fitting Broken Handles in Ruling Pens.....	.10
Aluminum Handles for Ruling Pens.....	.35
Ebony or Ivory Handles for Ruling Pens.....	.25
New Nut for Spring Bows.....	.20
New Nut and Thread for Spring Bows.....	.35
New Nut and Thread for Center Screw Spring Bows.....	.50
New Screws .....	.15
Re-Pointing Divider or Compass Points.....	.25
Joint Screws .....	.25
Polishing Dividers, large or small.....	.15
Polishing Attachments of Compasses, large or small.....	.10
Polishing Spring Bows, large or small.....	.25
Shouldered Needle Points, properly fitted.....	.10

German Parts for German Instruments:

	Each
Pen Points, Pencil Points or Needle Points for 4 in. Compasses,	\$1.00
Pen Points, Pencil Points or Needle Points for 6 in. Compasses,	1.25
Lengthening Bars for 3½ in. or 6 in. Compasses.....	1.15
(For Separate Parts of Richter Instruments, see page 48.)	

Remarks. In sharpening or grinding Ruling Pens we do not remove old ink with benzine or turpentine, but clean them carefully on the inner and outer edges with emery paper, thus insuring an easy flow of ink.

Grinding Pens, we refer to pens slightly broken off, or points which are in such a condition as to require re-shaping.



Schoenner's Best Quality German Drawing Instruments

Made of Rolled German Silver and Best English Steel



- | | | |
|------|--|--------|
| | | Each |
| 1508 | Ruling Pen, 4½ in. with lever, upper blade with spring, ebony handle | \$.90 |
| 1509 | Ruling Pen, 5 in. with lever, upper blade with spring, ebony handle | 1.00 |
| 1510 | Ruling Pen, 5½ in. with lever, upper blade with spring, ebony handle | 1.10 |



- | | | |
|------|---|--------|
| | | Each |
| 1515 | Detail Ruling Pen, 5 in., upper blade with spring, ebony handle | \$1.00 |
| 1516 | Detail Ruling Pen, 6 in., upper blade with spring, ebony handle | 1.15 |
| 1517 | Detail Ruling Pen, 7 in., upper blade with spring, ebony handle | 1.25 |



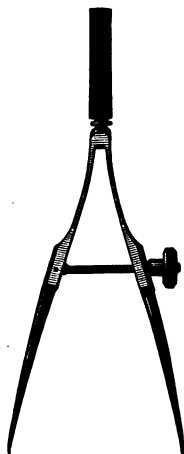
- | | | |
|------|---|--------|
| 1520 | Selfadjusting Bow Pen, 4 in. for very small circles.....each, | \$2.00 |
| 1521 | Selfadjusting Bow Pen, No. 1520, in case.....each, | 2.75 |



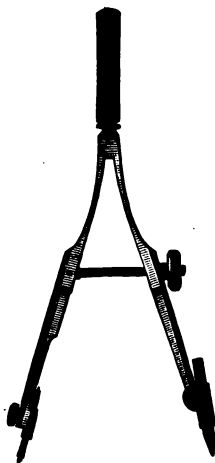
- | | | |
|------|---|--------|
| 1522 | Self Adjusting Bow Pen and Pencil, 4 in. for small circles, each, | \$3.00 |
| 1523 | Selfadjusting Bow Pen and Pencil, 4 in. No. 1522, in case, each, | 3.75 |

Schoenner's Best Quality German Drawing Instruments

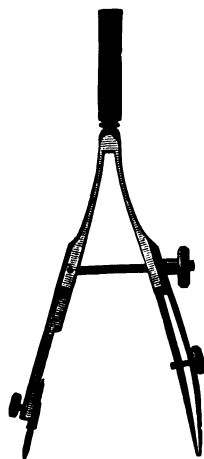
Made of Rolled German Silver and Best English Steel. Illustrations 2/3 size



1557

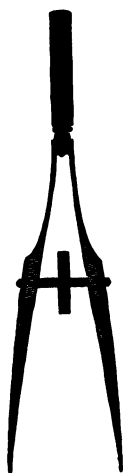


1558

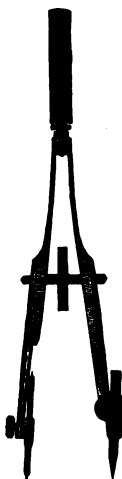


1559

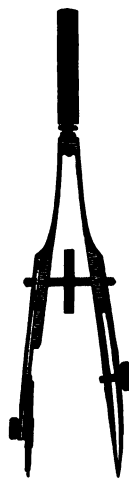
1557	Bow	Spacer, 3½ in. metal handle.....	each, \$1.05
1558	Bow	Pencil, 3½ in. metal handle.....	each, 1.45
1559	Bow	Pen, 3½ in. metal handle.....	each, 1.45
1567	Bow	Spacer, 2½ in. metal handle.....	each, 1.00
1568	Bow	Pencil, 2½ in. metal handle.....	each, 1.35
1569	Bow	Pen, 2½ in. metal handle.....	each, 1.35



1577



1578



1579

1577	Bow	Spacer, 3½ in. Center Screw. Adjustment, metal handle, Each	\$1.65
1578	Bow	Pencil, 3½ in. Center Screw Adjustment, metal handle, 1.95	
1579	Bow	Pen, 3½ in. Center Screw Adjustment, metal handle... 1.95	



Schoenner's Best Quality German Drawing Instruments

Made of Rolled German Silver and English Steel.

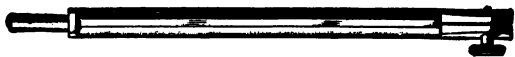
Illustrations $\frac{2}{3}$ size.



- 1580 Plain Divider, 6 in., with Straightening Device.....each, \$1.50
 1581 Plain Divider, 4 in., with Straightening Device..... " 1.35



- 1584 Hair Spring Divider, 6 in., with Straightening Device....each, \$2.20
 1585 Hair Spring Divider, 4 in., with Straightening Device.... " 1.75

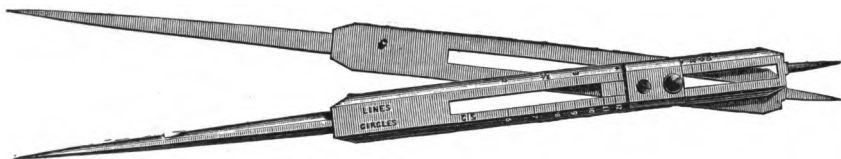


- 1588 Compasses, with Straightening Device, 6 in., with fixed
 Needle Point, Pencil Point, Pen Point and Length-
 ening Bareach, \$4.35
 1589 Compasses, 4 in., with Straightening Device, with fixed
 Needle Point, Pencil Point, Pen Point and Length-
 ening Bar " 3.50

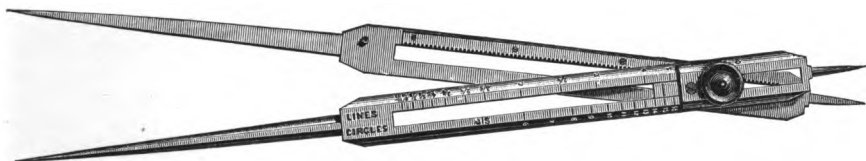
Schoenner's Best Quality German Drawing Instruments

Made of Rolled German Silver and English Steel

Illustrations 2/3 size

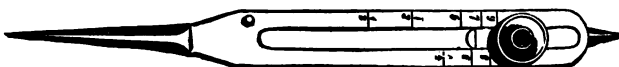


- 1590 Proportional Dividers, $7\frac{1}{2}$ in. finely divided for lines and circles, in caseeach, \$7.25



- 1591 Proportional Dividers, $8\frac{1}{2}$ in. with rack movement. Finely divided for lines and circles, in case.....each, \$9.25

Common or Ordinary Proportional Dividers



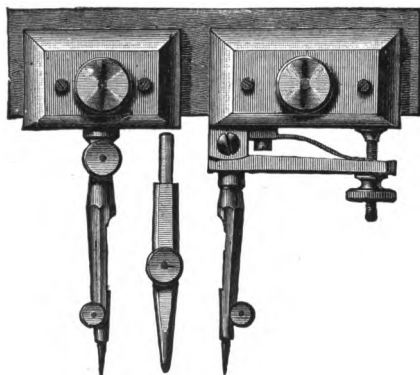
- 1592 Common Brass Proportional Dividers, $6\frac{1}{4}$ in. for lines only, in caseeach, \$1.90
- 1593 Common German Silver Proportional Dividers, $6\frac{1}{4}$ in., for lines only, in case.....each, 2.35



Schoenner's Best Quality German Drawing Instruments

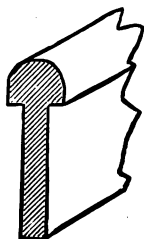
Made of Rolled German Silver and Best English Steel

Beam Compasses



1595	Beam Compasses	each, \$5.75
1596	Beam Compasses, No. 1595, in case.....	each, 6.60
1597	Beam Compasses, small pattern.....	each, 5.35
1598	Beam Compasses, small pattern, in case.....	each, 6.20

Beam Compass Bars



Style A



Style B

1599 Beam Compass Bars of hardwood:

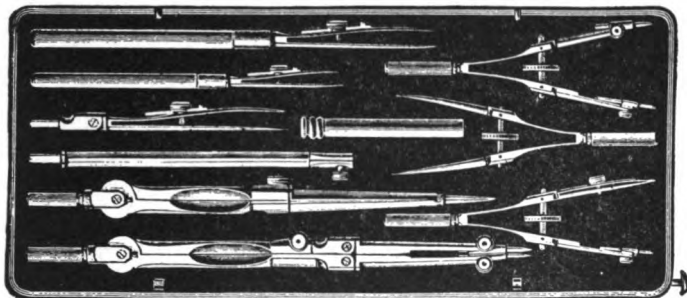
	24	30	36	42	48	60 in.
Each	\$.25	.30	.35	.40	.50	.65

Unless otherwise ordered, we furnish Beam Compass Bars Style A.

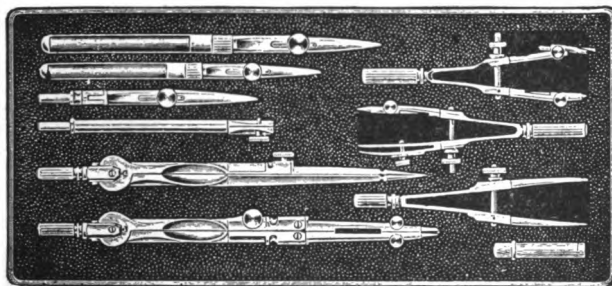
Schoenner's Best Quality German Drawing Instruments

Made of Rolled German Silver and English Steel.

In Pocket Book Cases.



- | | | |
|------|---|---------------|
| | Compasses, 6 in., No. 1588, with Straightening Device..... | |
| | Hair Spring Divider, 6 in., No. 1584, with Straightening Device | |
| 1652 | Bow Spacer, 3½ in., No. 1577, with Center Screw.. | each, \$14.30 |
| | Bow Pencil, 3½ in., No. 1578, with Center Screw.. | |
| | Bow Pen, 3½ in., No. 1579, with Center Screw.... | |
| | Ruling Pen, 4½ in., No. 1508, with Lever..... | |
| | Ruling Pen, 5 in., No. 1509, with Lever..... | |
| | Combination Lead Box and Screw Driver..... | |

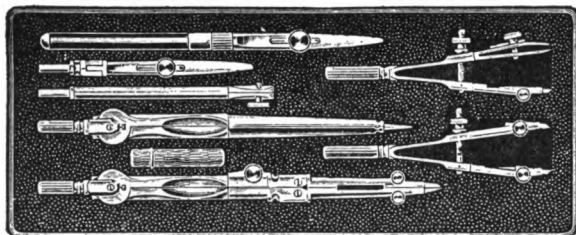


- | | | |
|------|---|---------------|
| | Compasses, 6 in., No. 1588, with Straightening Device..... | |
| | Hair Spring Divider, 6 in., No. 1584, with Straightening Device | |
| 1654 | Bow Spacer, 3½ in., No. 1557..... | each, \$13.10 |
| | Bow Pencil, 3½ in., No. 1558..... | |
| | Bow Pen, 3½ in., No. 1559..... | |
| | Ruling Pen, 4½ in., No. 1508, with Lever..... | |
| | Ruling Pen, 5 in., No. 1509, with Lever..... | |
| | Combination Lead Box and Screw Driver..... | |

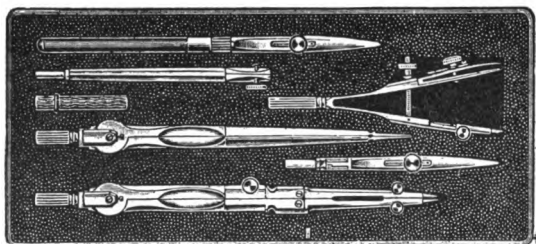


Schoenner's Best Quality German Drawing Instruments

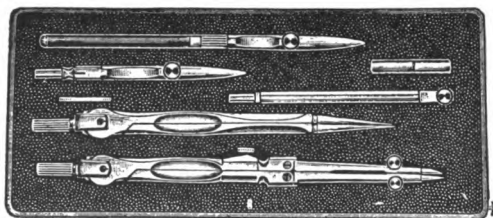
Made of Rolled German Silver and English Steel.
In Pocket Book Cases.



- 1656 { Compasses, 6 in., No. 1588, with Straightening Device.....
Divider, 6 in., No. 1580, with Straightening Device.....
Bow Pencil, 3½ in., No. 1558.....
Bow Pen, 3½ in., No. 1559.....
Ruling Pen, 5 in., No. 1509, with Lever.....
Combination Lead Box and Screw Driver..... } each, \$11.20

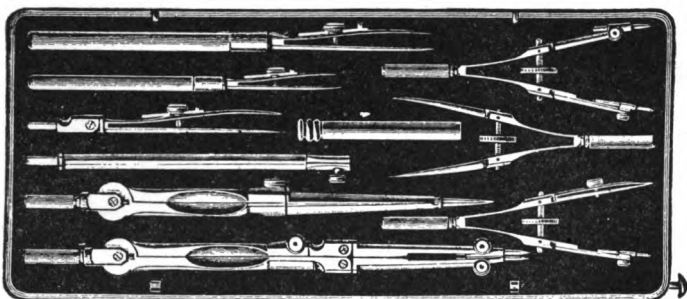


- 1658 { Compasses, 6 in., No. 1588, with Straightening Device.....
Divider, 6 in., No. 1580, with Straightening Device.....
Bow Pen, 3½ in., No. 1559.....
Ruling Pen, 5 in., No. 1509, with Lever.....
Combination Lead Box and Screw Driver..... } each, \$8.70

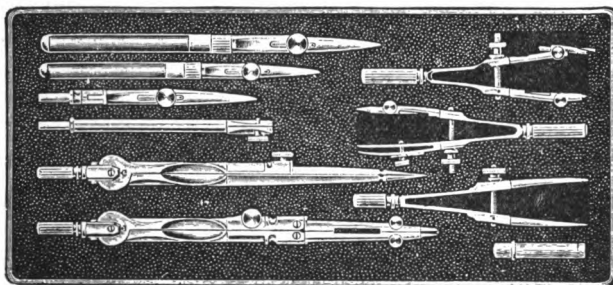


- 1659 { Compasses, 6 in., No. 1588, with Straightening Device.....
Divider, 6 in., No. 1580, with Straightening Device.....
Ruling Pen, 5 in., No. 1509, with Lever.....
Combination Lead Box and Screw Driver..... } each, \$7.40

Schoenner's Medium Quality German Drawing Instruments
In Pocketbook Cases.



- | | | | |
|------|---|---|-----------------|
| 1752 | { | Compasses, 6 in., with Straightening Device..... | } each, \$10.20 |
| | | Hair Spring Divider, 6 in., with Straightening Device | |
| | | Bow Spacer, 3½ in., with Center Screw..... | |
| | | Bow Pencil, 3½ in., with Center Screw..... | |
| | | Bow Pen, 3½ in., with Center Screw..... | |
| | | Ruling Pen, 4½ in., with Lever..... | |
| | | Ruling Pen, 5 in., with Lever..... | |
| | | Lead Box | |



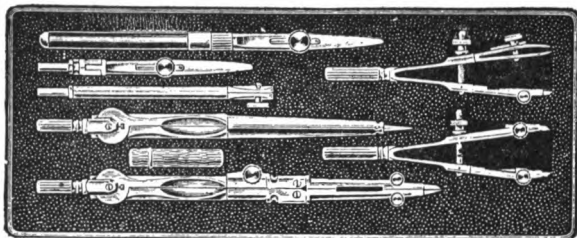
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|------|---|---|----------------|
| 1754 | { | Compasses, 6 in., with Straightening Device..... | } each, \$9.60 |
| | | Hair Spring Divider, 6 in., with Straightening Device | |
| | | Bow Spacer, 3½ in., metal handle..... | |
| | | Bow Pencil, 3½ in., metal handle..... | |
| | | Bow Pen, 3½ in., metal handle..... | |
| | | Ruling Pen, 4½ in., with Lever..... | |
| | | Ruling Pen, 5 in., with Lever..... | |
| | | Lead Box | |



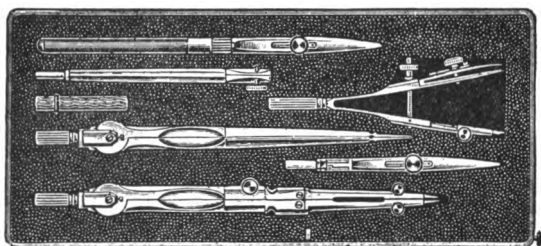
Schoenner's Medium Quality German Drawing Instruments

Made of German Silver, with Steel Points.

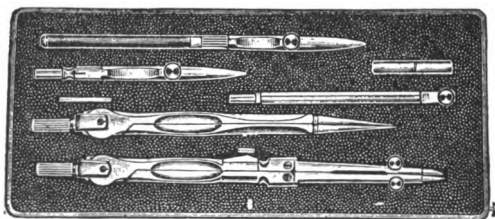
In Pocketbook Cases.



- 1756 { Compasses, 6 in., with Straightening Device.....
 Plain Divider, 6 in., with Straightening Device.....
 Bow Pencil, $3\frac{1}{2}$ in., metal handle.....
 Bow Pen, $3\frac{1}{2}$ in., metal handle.....
 Ruling Pen, 5 in., with Lever.....
 Lead Box } each, \$7.70



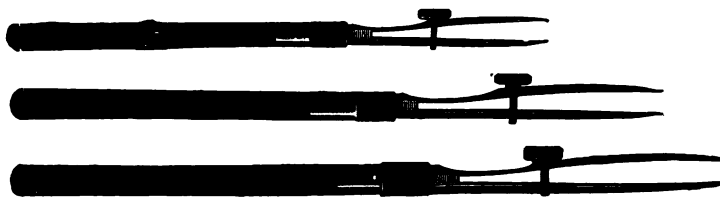
- 1758 { Compasses, 6 in., with Straightening Device.....
 Plain Divider, 6 in., with Straightening Device.....
 Bow Pen, $3\frac{1}{2}$ in., metal handle.....
 Ruling Pen, 5 in., with Lever.....
 Lead Box } each, \$6.70



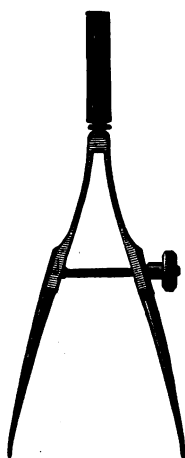
- 1759 { Compasses, 6 in., with Straightening Device.....
 Plain Divider, 6 in., with Straightening Device.....
 Ruling Pen, 5 in., with Lever.....
 Lead Box } each, \$5.60

Schoenner's School Quality German Drawing Instruments

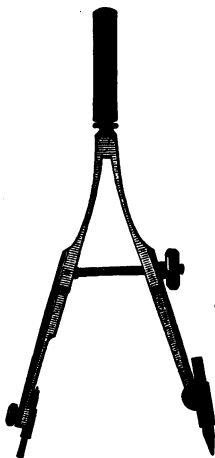
Made of German Silver and Steel. Illustrations 2/3 size.



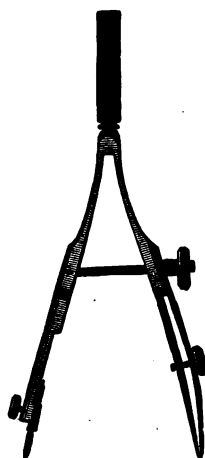
- | | | |
|------|---|--------|
| | | Each |
| 1802 | Ruling Pen, 4½ in. upper blade with spring, ebony handle..... | \$.35 |
| 1804 | Ruling Pen, 5 in. upper blade with spring, ebony handle..... | .40 |
| 1806 | Ruling Pen, 5½ in. upper blade with spring, ebony handle..... | .45 |



1807



1808



1809

- | | | |
|------|--------------------------------------|--------------|
| 1807 | Bow Spacer, 3½ in. metal handle..... | each, \$.70 |
| 1808 | Bow Pencil, 3½ in. metal handle..... | .90 |
| 1809 | Bow Pen, 3½ in. metal handle..... | .90 |



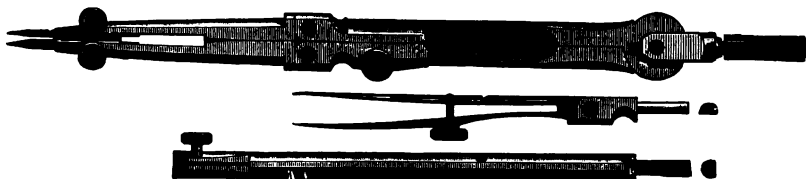
- | | | |
|------|--|--------|
| | | Each |
| 1815 | Plain Divider, 5 in. with Straightening Device, Round Points | \$.40 |



- | | | |
|------|---|--------------|
| 1816 | Hairspring Divider, 5 in. with Straightening Device, Round Points | each, \$.65 |
|------|---|--------------|



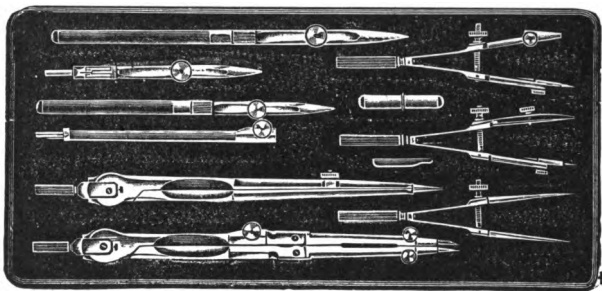
Schoenner's School Quality German Drawing Instruments—Continued



- 1820 Compasses, $5\frac{1}{2}$ in., with Straightening Device, Fixed Needle Point, Pen and Pencil Point, Lengthening Bar. each, \$1.70

Schoenner's School Quality German Drawing Instruments

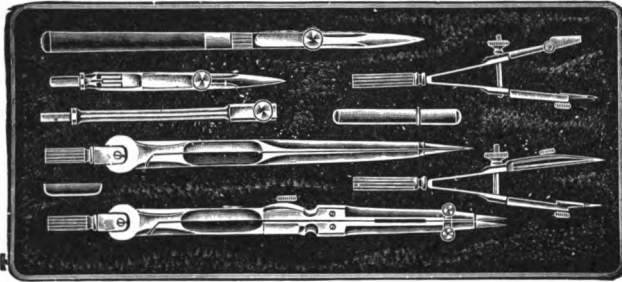
In Pocket Book Cases.



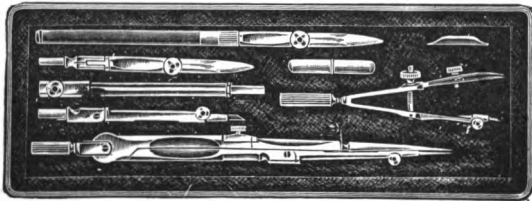
- | | | | |
|------|---|---|----------------|
| 1854 | { | Compasses, $5\frac{1}{2}$ in., No. 1820, with Straightening Device..... | } each, \$5.60 |
| | | Hair Spring Divider, 5 in., No. 1816, with Straightening Device..... | |
| | | Bow Spacer, $3\frac{1}{2}$ in., No. 1807, metal handle..... | |
| | | Bow Pencil, $3\frac{1}{2}$ in., No. 1808, metal handle..... | |
| | | Bow Pen, $3\frac{1}{2}$ in., No. 1809, metal handle..... | |
| | | Ruling Pen, $4\frac{1}{2}$ in., No. 1802..... | |
| | | Ruling Pen, 5 in., No. 1804..... | |
| | | Lead Box | |

Schoenner's School Quality German Drawing Instruments—Continued

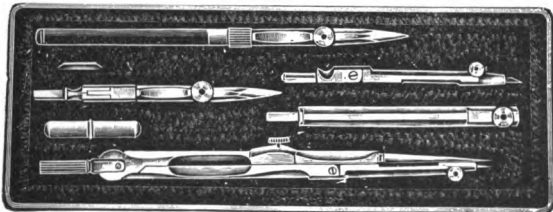
In Pocketbook Cases.



- | | | | |
|------|---|--|--------------|
| 1856 | { | Compasses, 5½ in., No. 1820, with Straightening Device | each, \$4.60 |
| | | Divider, 5 in., No. 1815, with Straightening Device | |
| | | Bow Pencil, 3½ in., No. 1808, metal handle..... | |
| | | Ruling Pen, 5 in., No. 1804..... | |
| | | Lead Box | |

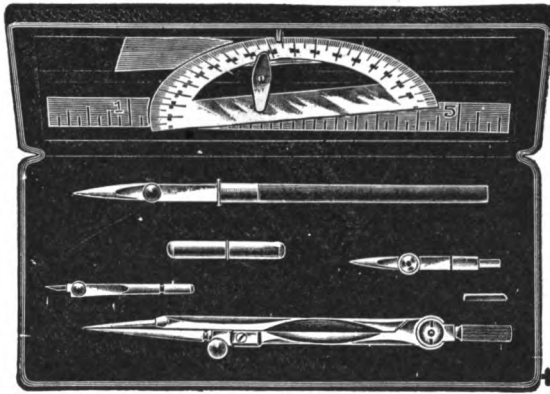


- | | | | |
|------|---|--|--------------|
| 1858 | { | Compasses, 5½ in., No. 1820, with Straightening Device | each, \$4.10 |
| | | Divider, 5 in., No. 1815, with Straightening Device.. | |
| | | Bow Pen, 3½ in., No. 1809, metal handle..... | |
| | | Ruling Pen, 5 in., No. 1804..... | |
| | | Lead Box | |



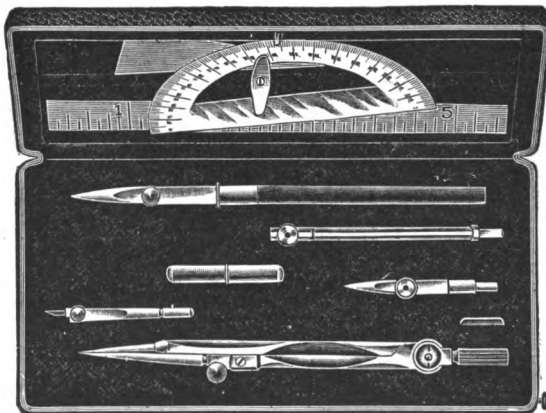
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|------|---|--|--------------|
| 1859 | { | Compasses, 5½ in., No. 1820, with Straightening Device | each, \$3.50 |
| | | Divider, 5 in., No. 1815, with Straightening Device.. | |
| | | Ruling Pen, 5 in., No. 1804..... | |
| | | Lead Box | |

"Beekman" Drawing Instruments.



1918

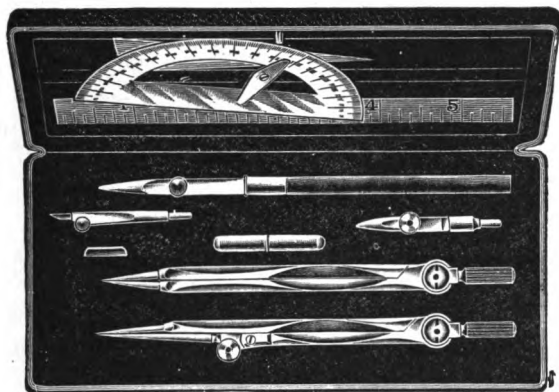
- 1918 $4\frac{1}{2}$ inch Compass, with Pen and Pencil Points, Ruling Pen, Protractor, Ruler, Box of Leads and Key, in case.....each, \$1.15
- 1919 Same set as 1918, without Ruling Pen, in case... " .95



1920

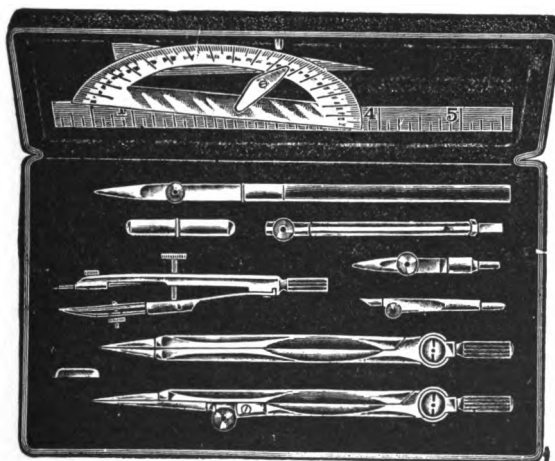
- 1920 $4\frac{1}{2}$ inch Compass, with Pen and Pencil Points and Lengthening Bar, Ruling Pen, Protractor, Ruler, Box of Leads and Key, in case.....each, \$1.30

"Beekman" Drawing Instruments — Continued.



1921

- 1921 $4\frac{1}{2}$ inch Compass, with Pen and Pencil Points, $4\frac{1}{2}$ inch Plain Divider, Ruling Pen, Protractor, Ruler, Box of Leads and Key, in case..... each, \$1.45
- 1922 Same set as 1921 with Lengthening Bar, in case..... " 1.65

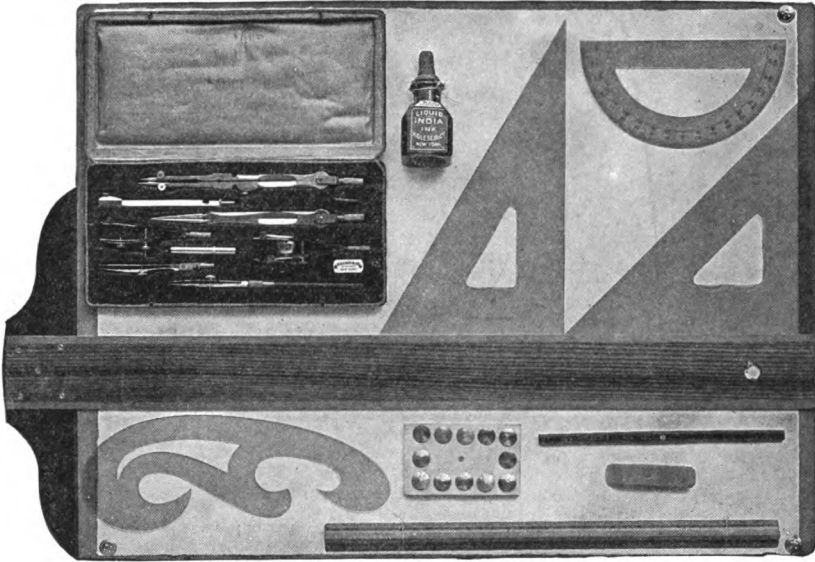


1923

- 1923 $4\frac{1}{2}$ inch Compass, with Pen and Pencil Points and Lengthening Bar, $4\frac{1}{2}$ inch Plain Divider, Spring Bow Pen, Ruling Pen, Protractor, Ruler, Box of Leads and Key, in case..... each, \$2.50



Students' Drawing Outfit



Specially adapted for Correspondence School Students in the courses of Architecture, Civil and Mechanical Engineering.

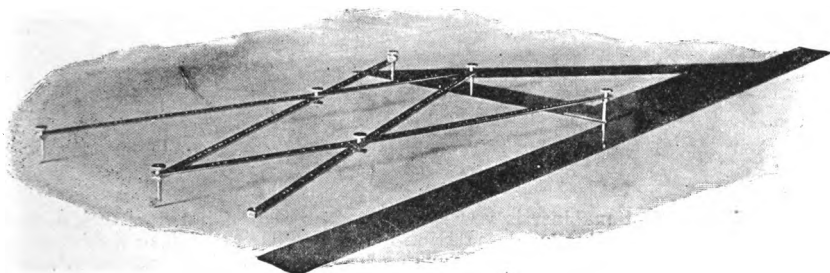
1935 Students' Drawing Outfit, consisting of:

Drawing Set, best quality in pocket book case, No. 1656,
 Drawing Board 16 x 21, No. No. 6161,
 Celluloid Triangle, 30° and 60°, 8 in., No. 5150,
 Celluloid Triangle, 45°, 7 in., No. 5152,
 Celluloid Lined T Square, 21 in., No. 6010,
 Celluloid Protractor, 6 in., No. 1971,
 Triangular Boxwood Scale, 12 in., No. 4052 or 4072,
 Celluloid Curve No. 6084, Pattern No. 3,
 Thumb Tacks, Steel, box containing 100, No. 6372,
 Lead Pencil, best grade 4H,
 Bottle of waterproof liquid drawing ink, No. 6400,
 Ink and Pencil Eraser,
 Whatman's Hot Pressed Paper, 6 sheets, 15 x 20,
 Tracing Cloth, 2 sheets, 16 x 21,
 Outfit completeeach, \$13.50

(Continued on next page)

The Boston Universal Pantograph.

PATENT APPLIED FOR.



1958 Boston Universal Pantograph, made of German silver, with 18 in.

Celluloid Triangle, and directions for use, in box.....each, \$45.00

The Boston Universal Pantograph has been designed in order to combine, at a reasonable cost, the accuracy of very expensive and intricate instruments, with the simplicity and handiness of cheap ones. The expectations have been more than fulfilled, inasmuch as the Boston Universal, besides combining the good qualities of former constructions, possesses some new ones of its own, and furthermore, in reducing and enlarging, covers a field never before attempted.

It is of the most simple construction, in principle somewhat similar to the ordinary wooden pantograph, and requires therefore, only a moment to be set to the desired proportion, ready for use.

It is made of metal throughout, with the minutest care and best workmanship, and compares in accuracy with the best instruments in the market, at a fraction of their cost.

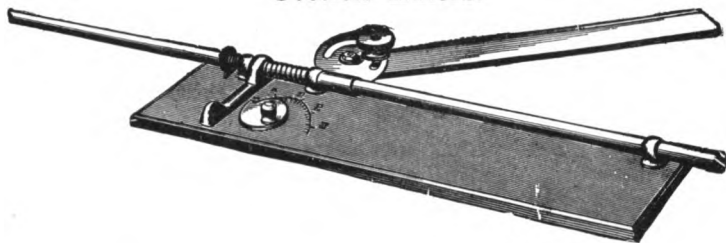
The pivotal point is mounted on a celluloid triangle which may be placed anywhere on the most delicate drawing without injuring it, and a few weights will secure its position as well as the commonly used screws or claws.

The center of the pivot is placed exactly over the right-angled corner of the triangle and can, therefore, easily be marked on the plan, making it possible—

- 1st. To remove the pantograph entirely and replace it as often as desired.
- 2nd. To change the position of the triangle and still keep the same pivotal point, thus gaining access to that part of the drawing which the triangle may have covered at first, and obtaining a copy of the entire drawing within the sweep of the pantograph (a circle 8 feet in diameter) without leaving any "bald spots" to be covered separately.
- 3d. To move the pivotal point from place to place on the plan in a systematic manner and thus reduce or enlarge plans of unlimited size and still get the copy in one piece.

In addition to its use for plain reducing and enlarging, the Boston Universal Pantograph covers a new field in being able to give a copy of a drawing distorted in a systematic manner, as shown to some extent in the accompanying cut, making the pantograph adapted to a variety of purposes more readily imagined than enumerated. These results have been obtained by sliding the triangle on which the pivot is mounted along a straight edge, keeping one side of the triangle against the tracer and consequently against the pencil. In this way the scale parallel to the straight edge is retained and the scale at right angles (or 45 degrees) thereto is changed. An easily acquired familiarity with the pantograph will suggest a wide range of possibilities.

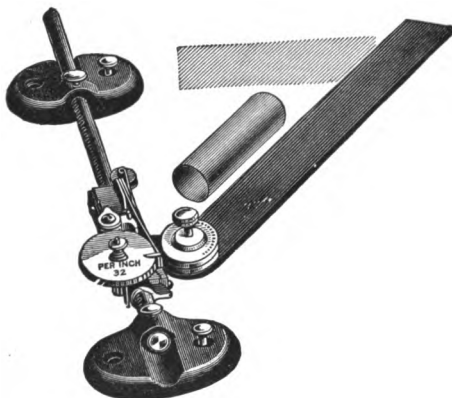
Section Liners.



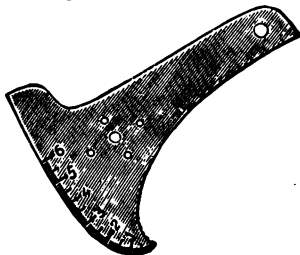
The **Sphinx Section Liner** is very simple in construction, but nevertheless does very accurate work, whether for close section-lining of 100 to the inch, or wide spacing of 2 to the inch; it can be adjusted to any number of lines per inch and to any angle without changing the position. The instrument rests firmly on the board by means of pins in the bottom, and does not require to be held in position by either T square, straight edge, the hands or weights. (Directions with every instrument.)

The operation of the instrument is very simple and requires no practice.

- 1960 Sphinx Section Liner, in case.....each, \$1.50
 1961 Sphinx Section Liner, with celluloid lined blade, in case..... " 2.00



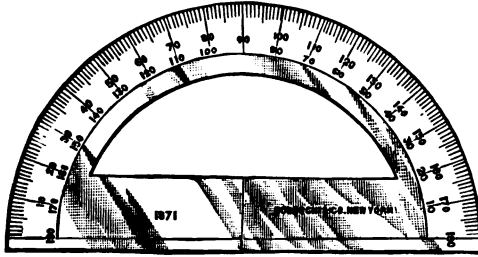
- 1965 Gardam's Section Liner, Blade 12 inches long, in box.....each, \$6.50
 1966 Gardam's Section Liner, Blade 14 inches long, in box..... " 7.50
 (Full description with every instrument.)



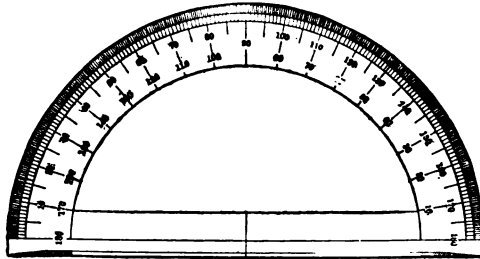
- 1968 **Templet Odontograph**, for describing Teeth of Gear Wheels, a valuable instrument for millwrights, machinists, pattern-makers, etc., with full description, in case.....each, \$3.50

BARTH'S Gear Slide Rule, see page 94.

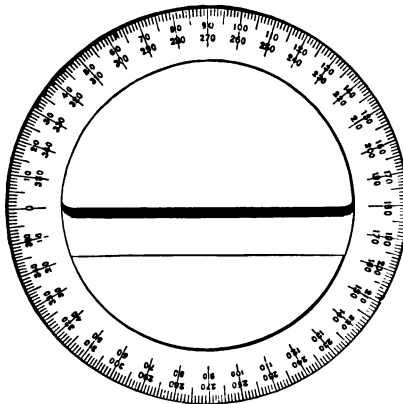
Celluloid Protractors, Engine Divided



- | | | |
|------|---|--------------|
| 1970 | Semi-circular Celluloid Protractor, 5 in., open center, divided to $\frac{1}{2}$ deg..... | each, \$.75 |
| 1971 | Same as No. 1970 but 6 in..... | “ .90 |
| 1972 | Same as No. 1970 but 8 in..... | “ 1.20 |
| 1973 | Same as No. 1970 but 10 in..... | “ 2.00 |



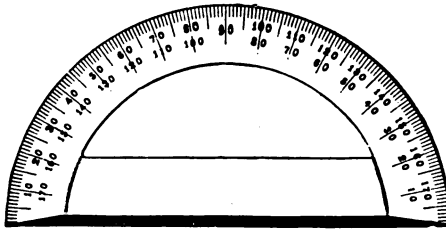
- | | | |
|------|--|--------------|
| 1975 | Semi-circular Celluloid Protractor, 6 in., beveled edge, open center, $\frac{1}{2}$ deg..... | each, \$2.75 |
| 1976 | Same as No. 1975 but 8 in..... | “ 3.50 |
| 1977 | Same as No. 1975 but 10 in..... | “ 4.50 |



- | | | |
|------|---|--------------|
| 1980 | Circular Celluloid Protractor, 6 in., beveled edge, open center, $\frac{1}{2}$ deg..... | each, \$3.50 |
| 1981 | Same as No. 1980 but 8 in..... | “ 4.50 |
| 1982 | Same as No. 1980 but 10 in..... | “ 5.50 |

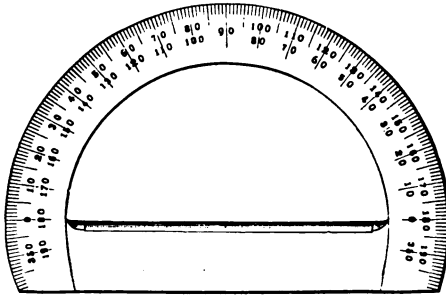


German Silver Protractors



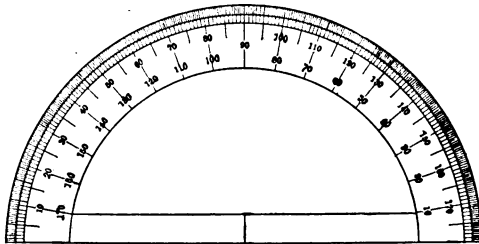
Beveled Edge, Center on Outer Edge.

		Each
2000	Semi-circular German Silver Protractor, 5 in., divided to $\frac{1}{2}$ deg.	\$1.75
2002	Semi-circular German Silver Protractor, 6 in., divided to $\frac{1}{2}$ deg.	2.40
2004	Semi-circular German Silver Protractor, 8 in., divided to $\frac{1}{2}$ deg.	4.15



Beveled Edge, Center on Inner Edge.

		Each
2010	Semi-circular German Silver Protractor, 5 in., divided to $\frac{1}{2}$ deg.	\$2.00
2012	Semi-circular German Silver Protractor, 6 in., divided to $\frac{1}{2}$ deg.	2.40
2014	Semi-circular German Silver Protractor, 8 in., divided to $\frac{1}{2}$ deg.	3.00

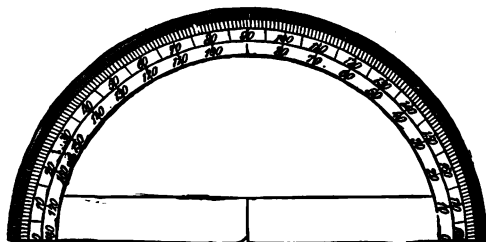


Plain, Center on Outer Edge.

		Each
2020	Semi-circular German Silver Protractor, $5\frac{1}{8}$ in., div. $\frac{1}{2}$ deg....	\$.60
2022	Semi-circular German Silver Protractor, $6\frac{3}{8}$ in., div. $\frac{1}{2}$ deg....	.80
2024	Semi-circular German Silver Protractor, $8\frac{1}{2}$ in., div. $\frac{1}{2}$ deg....	1.50

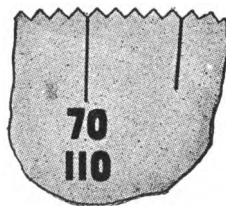
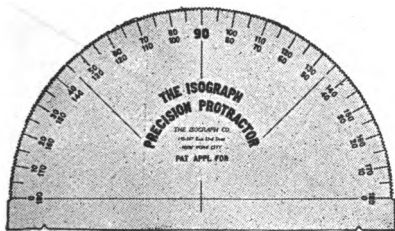
Protractors—Continued

Brass Protractors



- | | | |
|------|--|--------|
| 2030 | Semi-circular Brass Protractor, $3\frac{3}{4}$ in., divided to 1 deg..each, | \$.10 |
| 2032 | Semi-circular Brass Protractor, $4\frac{1}{4}$ in., divided to 1 deg.. | " .25 |
| 2034 | Semi-circular Brass Protractor, $5\frac{1}{8}$ in., divided to $\frac{1}{2}$ deg.. | " .50 |
| 2036 | Semi-circular Brass Protractor, $6\frac{3}{8}$ in., divided to $\frac{1}{2}$ deg.. | " .70 |

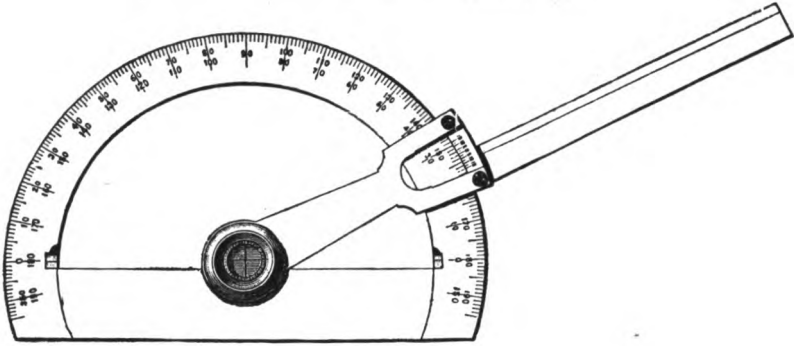
Isograph Precision Protractor



- | | | |
|------|-------------------------------------|--------------|
| 2050 | Isograph Precision Protractor | each, \$.50 |
|------|-------------------------------------|--------------|

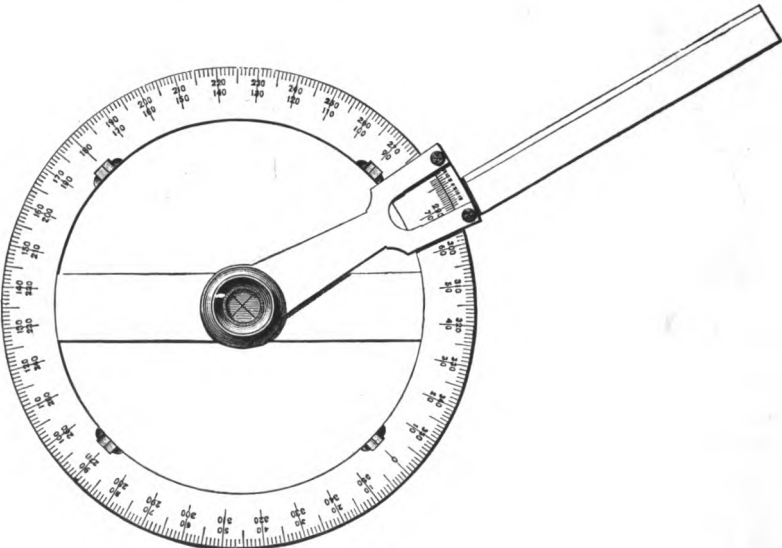
Made of transparent celluloid and has the degrees indicated by notches instead of lines (see cut). To lay off a degree put the pencil in the notch corresponding to the degree wanted. For $\frac{1}{2}$ degrees set pencil at the projecting points between the notches. When a number of angles are to be laid off from a common apex, the protractor instead of being held by hand, can be fastened to the paper by two thumb tacks inserted in the notch, at each end of the base line.

Semi Circular Protractors.



Semi-circular Protractors, made of German Silver, with Vernier, Horn Center and Movable Arm.

2214	5½ in., divided to ½ deg., Vernier reading to 3 minutes, length of arm beyond outer edge, 5½ in.....	each, \$10.00
2215	Same, in Morocco Case.....	" 13.50
2218	8 in., divided to ¼ deg., Vernier reading to 1 minute, length of arm beyond outer edge, 6 in.....	" 14.00
2219	Same, in Morocco Case	" 18.00
2240	10 in., divided to ¼ deg., Vernier reading to 1 minute, length of arm beyond outer edge, 6½ in.....	" 17.00
2241	Same, in Morocco Case.....	" 21.50

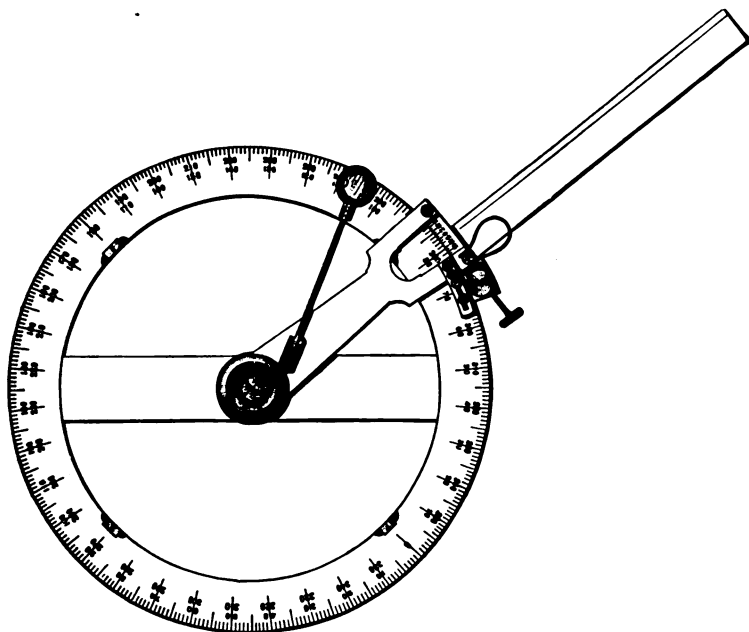


For prices and description see page 85.

Circular Protractors—Continued.

Circular Protractors, made of German Silver with Vernier, Horn Center and Movable Arm.

2244	5½ in., divided to ½ deg., Vernier reading to 3 minutes, length of arm beyond outer edge, 5½ in.....	each, \$14.00
2245	Same, in Morocco Case.....	" 18.00
2256	8 in., divided to ¼ deg., Vernier reading to 1 minute, length of arm beyond outer edge, 6 in.....	" 16.00
2257	Same, in Morocco Case.....	" 20.50
2264	10 in., divided to ¼ deg., Vernier reading to 1 minute, length of arm beyond outer edge, 6½ in.....	" 20.00
2265	Same, in Morocco Case.....	" 25.00

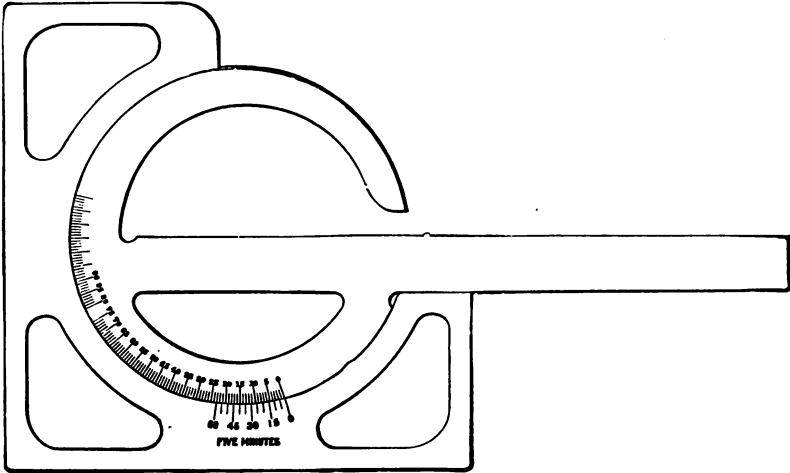


Circular Protractor, made of German Silver, with Vernier, Horn Center, Movable Arm, Clamp Screw and Micrometer Adjusting Screw to Vernier.

2268	8 in., divided to ¼ deg., Vernier reading to 1 minute, length of arm beyond outer edge, 6 in.....	each, \$20.00
2269	Same as No. 2268, with attached magnifying lens.....	" 23.50
2274	10 in., divided to ¼ deg., Vernier reading to 1 minute, length of arm beyond outer edge, 6½ in.....	" 24.00
2275	Same as No. 2274, with attached magnifying lens.....	" 27.75
2278	Morocco Case for No. 2268 or No. 2269.....	" 4.55
2279	Morocco Case for No. 2274 or 2275.....	" 5.60



Protractors—Continued.



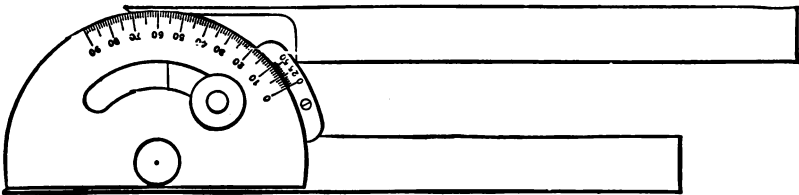
2306 Patented Draughtsman's Protractor.....each, \$6.50

2307 Patented Draughtsman's Protractor, in Morocco Case..... " 7.75

The above Protractor can be quickly set to any angle. It can be used either side up and on either side of the two straight edges, and it is of advantage in dividing a circle, transferring angles or laying off a given angle without resetting, on either side of a line.

The Vernier reads to five minutes.

It forms a convenient extension to a T square, and frequently takes the place of 45 deg. and 60 deg. triangles.



2320 Patented Draughtsman's Protractor.....each, \$4.00

2321 Patented Draughtsman's Protractor, in polished hardwood case.... " 5.00

The above Protractor has spring tempered steel blades about 9 inches long. The arc is 4 inches in diameter, graduated to degrees, with a vernier reading to five minutes.

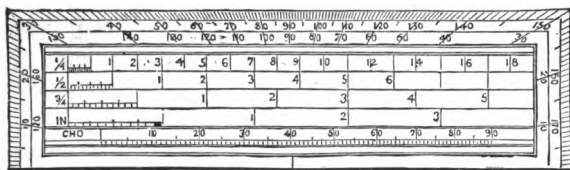
It has a Binding Screw on one side that securely holds the blades at any angle and enables it to be picked up and moved about readily.

The blades are fastened into the arc in such a manner so as to make all parts come flush on the under side, thus making a perfectly flat surface for resting on the table or drawing.

Either blade can be used in contact with a T square, giving any angle and its complement from 0 degrees to 90 degrees.

It forms a perfectly adjustable triangle.

Boxwood and Ivory Protractors.



Slide Rules

The "Precision" Slide Rules as listed on the following pages are made of the very best, well seasoned Mahogany stock built up in sections, and with facings of white celluloid on both the upper and lower side of the rules.

The graduations are all engine divided, clearly and accurately cut and on account of the white background, very legible. Particular care and attention is paid to have all scales in perfect alignment.

Each rule is furnished with an aluminum indicator with a fine hair line etched on the glass, insuring very accurate readings and interpolations. Complete book of instructions, written in non-technical language, with each rule.

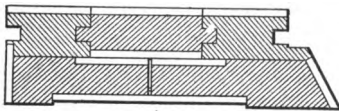


Fig. I.

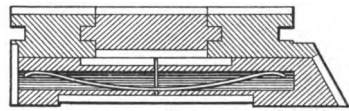


Fig. II

Above cuts illustrate the latest improved SELFADJUSTING construction of the "Precision" Slide Rule. The unshaded parts denote the strips of white celluloid, the ends of which are fastened to the wood by German Silver screws, insuring absolute adherence to the body of the rule.

The shaded parts, as shown in cuts, denote the mahogany stock built up in sections to prevent warping.

The rule has imbedded in its interior, three concealed tempered steel springs made of the very finest of material; one near each end of the rule, and one in the center.

Fig. I illustrates the saw cut through the entire length of the rule and shows the steel spring passing through the saw cut from one side of the solid stock to the other.

Fig. II illustrates the position of the steel spring, with the rule cut open at the point where the central spring passes through the body of the rule.

Each spring is fitted tightly into its respective partition, avoiding all lateral play.

This simple but effective construction makes the rule absolutely self-adjustable and will never require any adjusting in the hands of the user.

The elastic and comparatively slight pressure exerted by the steel springs holds the two sections of the rule against the slide with a moderate but even pressure. The slide will therefore always move with a free and even motion, at all times and under all changes of atmospheric conditions.

"Precision Slide Rule"

Improved Construction.

(For description see previous page)

Mannheim Style.

WHITE FACINGS.

Each Rule with Indicator, Case and Book of Directions.

	Each
2509 5 inch, with single line Indicator, No. 2790..	\$3.50
2562 8 inch, with single line Indicator, No. 2790..	4.00
2564 8 inch, with broken line Indicator, No. 2792..	4.25
2574 10 inch, with single line Indicator, No. 2790..	4.25
2576 10 inch, with Indicator, No. 2791, with 2 hair lines set in the ratio of 1/12.....	4.25
2578 10 inch, with broken line Indicator, No. 2792..	4.50
2580 15 inch, with single line Indicator, No. 2794..	9.50
2622 20 inch, with single line Indicator, No. 2794..	12.50
2623 20 inch, with Indicator, No. 2794, with 2 hair lines set in the ratio of 1 : .7854.....	12.50

FOR SCHOOL USE

Useful in teaching classes on Slide Rules or for other demonstrative purposes.

2630 "Precision" Slide Rule, 40 in. long, with directions, in wooden box.....each, \$50.00

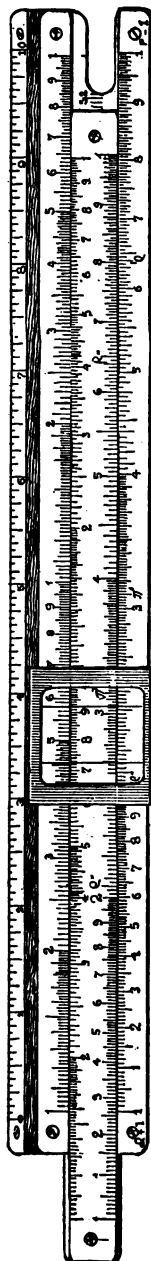
"Rival" Slide Rule.

2711 "Rival" Slide Rule, 10 in., mahogany stock, celluloid facings, light construction, with Indicator, Nos. 2790 or 2791, with directions, in case.....each, \$3.00

"Stadia" Slide Rule.

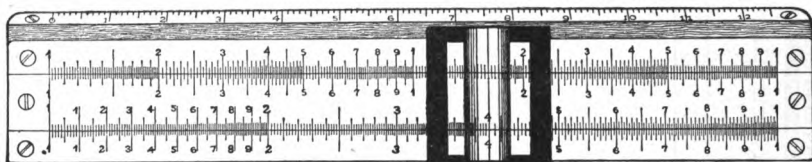
Contains, besides the regular scales on the "Precision" Slide Rule, additional scales for calculating stadia readings.

2713 "Stadia" Slide Rule, 10 in., built up mahogany stock, white facings, improved construction, with directions, in case, each, \$6.50



The "Midget" Slide Rule.

White Facings.

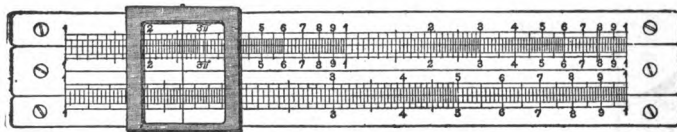


2715. ($\frac{3}{4}$ actual size.)

The "Midget" Slide Rule combines the accuracy of a regular 10 inch "Precision" Slide Rule with the convenience afforded by its compactness and portability. Although its dimensions are restricted to only $5\frac{1}{2}$ in. in length, 1 in. in width and $\frac{1}{8}$ in. in thickness, and its weight, including the case, does not exceed $1\frac{1}{2}$ oz., it ranks in accuracy and reliability with the larger rules. In the construction of the stock, the same vital improvements are embodied which distinguish our slide rules. The ultimate subdivisions are as fine as those on the regular 10 in. rule, and by means of a powerful, yet compact and convenient magnifying glass, their value is easily ascertained with the same percentage of accuracy as can be obtained by the 10 inch rules.

- 2715 "Midget" Slide Rule, 5 in. long, built up mahogany stock, white facings, engine divided, improved construction, with magnifier, in sewed leather case with clasp and directions.....each, \$4.50

"Vest Pocket" Slide Rule



2717

- 2717 "Vest Pocket" Slide Rule, 5 in., thin mahogany stock, celluloid facings, narrow for pocket use, with glazed aluminum indicator, case and directions..... each, \$2.25

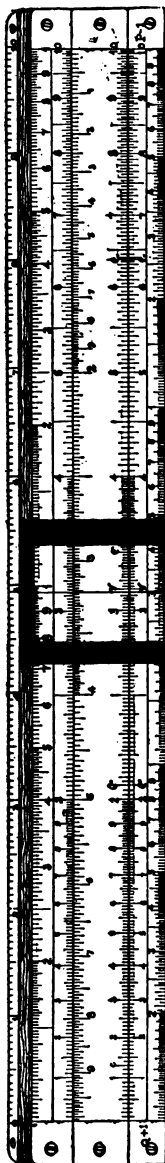
Nestler's Precision Slide Rule

The feature of this Slide Rule is that it is really a 20-inch Slide Rule in a 10-inch length; giving all the fine subdivisions of a 20-inch Rule in a length of 10 inches.

- 2761 Nestler's Precision Slide Rule, with directions, in case.....each, \$8.00
 2763 Nestler's Precision Slide Rule, same as 2761, but 20 inches long; gives all the fine subdivisions of a rule 40 inches long in a length of 20 inches; with directions, in case.....each, \$22.50

The "Triplex" Slide Rule

A modification of the Mannheim Slide Rule, although resembling the latter in construction and outer appearance, differs from it by the unique grouping of the different scales; these are arranged on the rule starting at the top scale and proceeding to the bottom (see illustration) as follows:



Scale on beveled edge: inches and sixteenths.

Upper scale on top guide piece: Scale of Squares.

Lower scale on top guide piece: Scale from 1—10.

Upper scale on slide: Inverted scale from 10—1.

Lower scale on slide:

Upper scale on bottom guide piece: } Scale from 1—10.

Lower scale on bottom guide piece: Scale of Cubes.

On the reverse of the slide are engraved:

Scale S: Scale of Sines from 34 minutes to 90 degrees.

Scale L: Scale of Logarithms:

Scale T: Scale of Tangents from 5 degrees 42 minutes to 45 degrees.

Scale on straight bottom edge: cm. and mm., continued on the bottom of channel in rule.

To the back of the rule is affixed a printed table of ratios or equations.

This arrangement of the scales greatly simplifies the use of the rule, especially when it is employed in solving complex calculations. It greatly facilitates the solving of the following arithmetical and trigonometrical computations.

1 An inverted scale of logarithms is always in position for immediate use to solve inverted proportions, etc.

2 By using the two adjoining upper scales of slide and rule for multiplying and the two lower for dividing the result will always be found on the rule beneath one of the indexes.

3 Three numbers can be multiplied by one setting and the square or cube of the product read by means of the indicator.

4 Three successive numbers can be divided consecutively by one setting, and the square or cube of the quotient read by means of the indicator.

5 Two or three numbers may be multiplied in rotation, the product divided by another number and the quotient found by one or two settings.

6 From the foregoing it will be obvious that compound calculations can be performed on the "Triplex" rule by about one-half the number of settings required on the regular rule and consequently in one-half of the time.

7 Squares, Square Roots, Cubes or Cube Roots can be read off without any setting by means of the indicator, fourth and sixth powers of roots by one setting, fifth and seventh powers by two settings, etc.

2775 "Triplex" Slide Rule, 10 in., built up mahogany stock, white facings, glazed aluminum indicator, with directions, in case...each, \$5.00

2777 "Triplex" Slide Rule, same as No. 2775, but 20 in. long, with directions, in case...each, \$14.00

($\frac{1}{2}$ actual size)



Slide Rules—Continued

- 2785 Log-Log Slide Rule**, 10 inch, white face. Has in addition to the regular A, B, C and D scales, two additional scales by means of which all powers and roots, whether with whole or fractional, positive or negative exponents, can be read off with a single setting. With aluminum indicator, with directions in case..... each, \$7.50
- 2787 Chemical Slide Rule**, for calculations in Organic and Inorganic Analysis, reduction of gases, etc. 10 in. mahogany stock, white facings, aluminum indicator, in case.....each, \$4.50
- 2789 Electrical Slide Rule**, especially designed for the use of electrical engineers. Besides the regular A, B, C and D scales it has various scales which apply to the calculations used in electro-technical problems. 10 in. mahogany stock, white facings, with aluminum indicator, in caseeach, \$5.75



2790



2791



2792



2793

Indicators for Slide Rules

Aluminum frame with hair line etched on the glass

- 2790** Indicator, single line for rules Nos. 2509, 2562, 2574, 2711, each, \$.50
- 2791** Indicator, double line for rules Nos. 2509, 2562, 2574, 2711, each, .70
- 2792** Indicator, broken line for rules Nos. 2509, 2562, 2574, 2711, each, 1.05
- 2793** Brass Indicator for rules Nos. 2509, 2562, 2574, 2711.....each, .75
- 2794** Indicators for rules Nos. 2580, 2622, 2761, 2763, 2775, 2777, 2789,each, .75
- 2795** Indicator for Midget Slide Rule No. 2715.....each, 1.00
- 2796** Magnifying Indicator for 8 and 10 in. rules.....each, 2.00
- 2797** Magnifying Indicator for 15 and 20 in. rules.....each, 2.50

Sewed Leather Cases for Slide Rules

2800 Sewed Leather Cases for Slide Rules

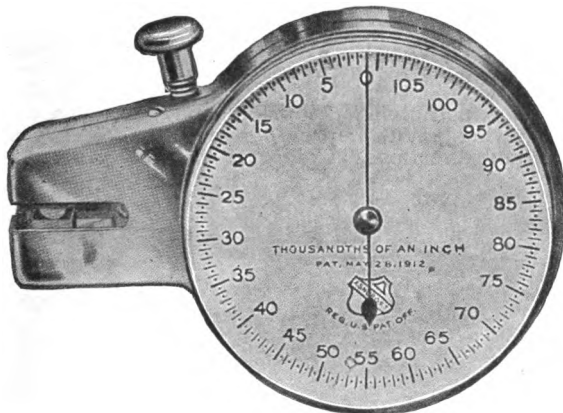
For	5	8	10	15	20 in. rules
Each,	\$.70	.80	.90	1.10	1.40

2805 Sewed Leather Cases for Slide Rules with space for magnifying indicator

For	5	8	10	15	20 in. rules
Each,	\$1.20	1.30	1.40	1.80	2.10



- 2893 The Charpentier Circular Slide Rule**, as shown in illustration above, was designed for vest pocket use. It consists of a German silver disc, $2\frac{3}{8}$ inches diameter, which forms the body of the rule. A brass ring serving as a slide is recessed in the German silver body and is operated by the handle. It compares favorably with a 5 inch slide rule, on account of its compactness and portability, and because it is not affected by changes of temperature.....each, \$5.00
- 2894 The Boucher Watch Form Slide Rule** is constructed in the form of a stem-winding double-face-watch. Compound calculations can be performed easily on this calculator by means of two pointers, operated by the stemwinder, and indicating simultaneously on both dials.....each, 8.50
- 2895 Same as 2894, with Metal Dials**..... 14.50



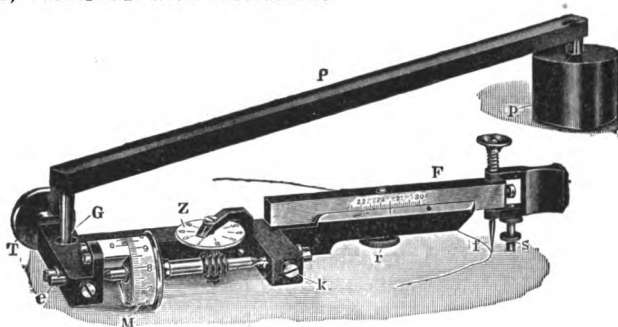
- 2897 Thickness Gauge**, 2 in. nickel case, in card board case, with directionseach, \$10.00
- 2898 Thickness Gauge**, No. 2897, in calf skin pocket case, with directions,each, 10.50

For accurately measuring the thickness of papers of all description, mounting boards, sheet rubber, celluloid, leather, sheet metal or any sheet material not exceeding 0.11 inch in thickness. The jaws are opened by pressing push button, which when released, automatically closes the jaws, and the thickness of the material inserted between the jaws is indicated on the dial. Reads to one-half thousandths.

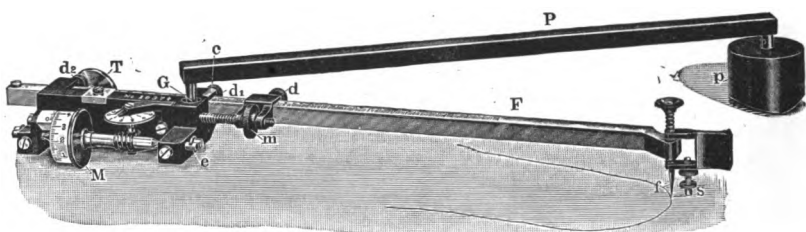


Compensating Planimeters

Compensating Planimeters as listed on this page are the latest improved type of the Polar Planimeter. As per illustration, the connection between the tracer arm and the pole arm is a ball and socket joint, which allows the use of the instrument in two opposite symmetrical positions. The area to be computed is traced (clockwise) with the pole arm at the right, and the reading on the roller noted. The instrument is then reset with the pole arm at the left, and the outline again traced in the same clockwise manner, the reading taken and then the mean average between the two readings will give the correct result. Thus a compensation of errors, both in the tracing of the outline and the reading of the vernier is obtained. An exhaustive treatise on the use and application of the planimeter, furnished with instrument.

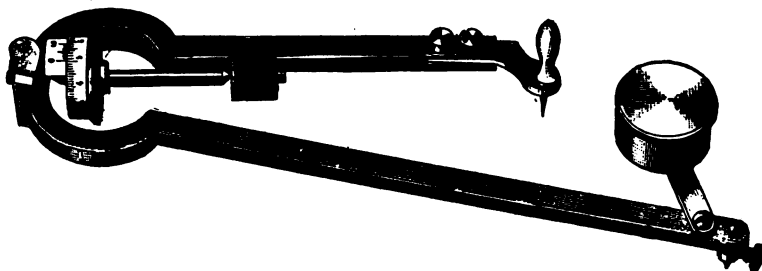


- 2930 Compensating Planimeter**, with short graduated tracer arm with limited adjustment; generally used with the vernier set for the unit of 0.01 sq. inches. In drawings made to scale the area is obtained by multiplying the reading on the roller with the scale of the drawing. With improved Needle Pole, Test Rule, Table of Settings and directions, in morocco case.....each, \$24.00

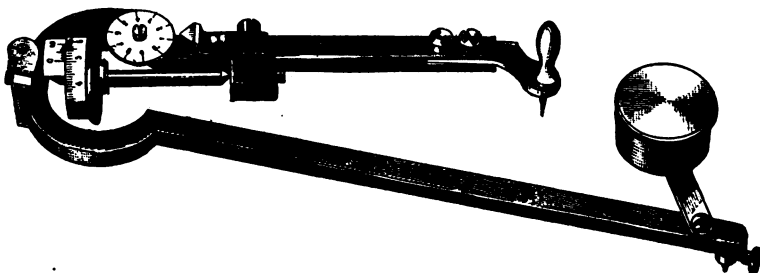


- 2932 Compensating Planimeter**, with adjustable tracer arm, 9 inches long, adjustable in its entire length, with micrometer vernier for accurate setting. Fully graduated to inches and metric measurements. With improved Needle Pole, Test Rule, Table of Settings and directions, in morocco case.....each, \$35.00
- 2934 Compensating Planimeter**, same as No. 2932, but with Extension Pole Arm for computing larger areas. With improved Needle Pole, Test Rule, Table of Settings and directions, in morocco caseeach, \$44.00

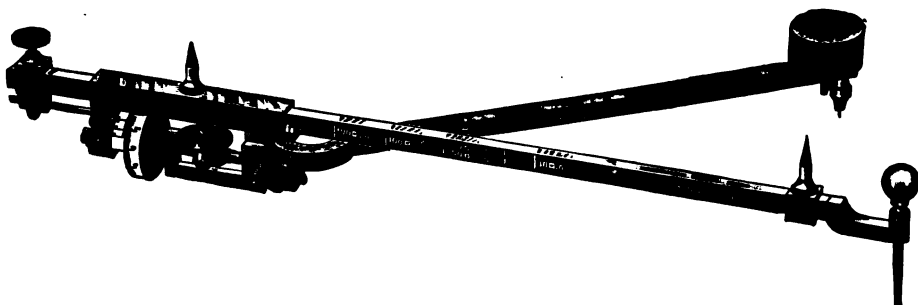
Planimeters



- 2941** Polar Planimeter, German silver, for measuring areas up to 10 square inches, in inches, tenths and hundredths of a square inch. Needle pole to balance instrument, Fixed Tracer Arm, in case.....each, \$14.00

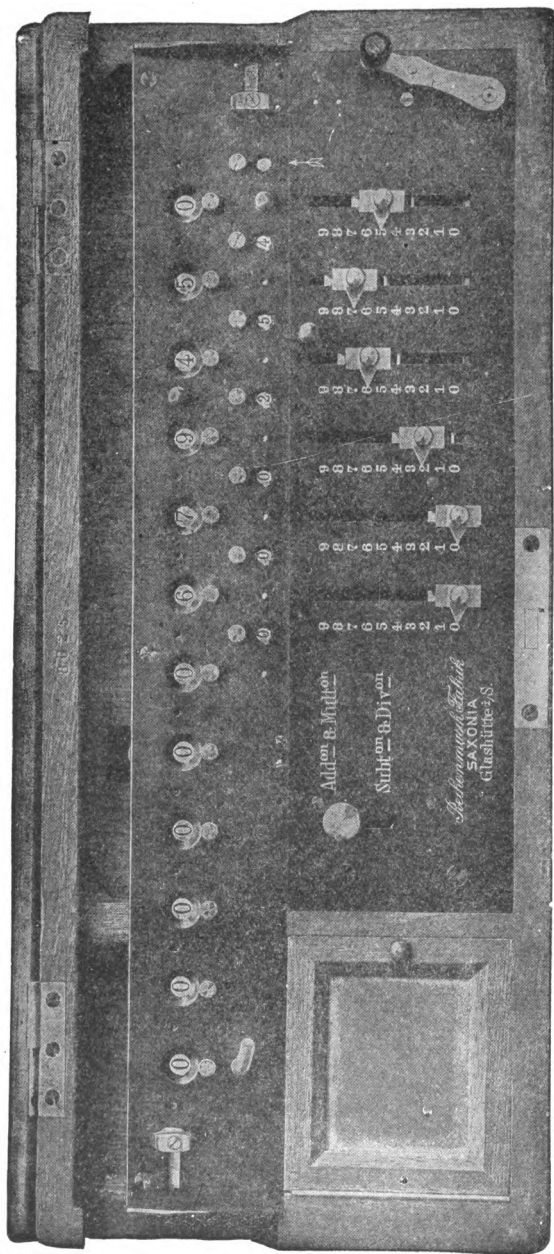


- 2943** Planimeter, German silver, for measuring areas up to 100 square inches, in inches, tenths and hundredths of a square inch. Needle pole to balance instrument, Fixed Tracer Arm, in case.....each, \$16.50



- 2945** Polar Planimeter, German silver, with Adjustable Tracing Arm, about 9 inches long, for measuring areas. **With special arrangement for determining the mean height of Indicator Diagrams.** Needle pole, test plate and directions in morocco case.....each, \$35.75

For Indicator Scales, see list of scales.

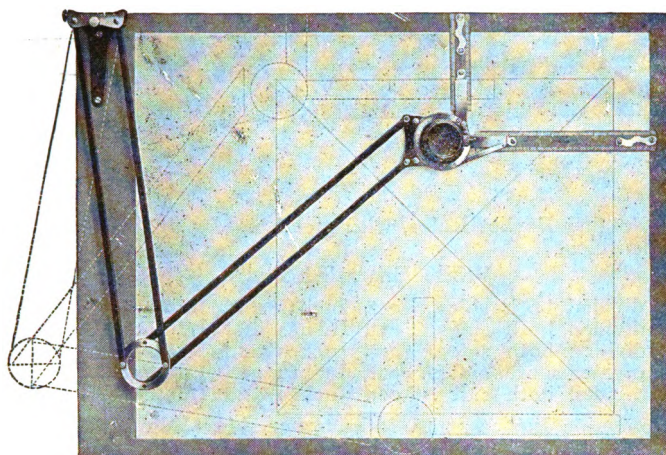


The "Saxonia" Reckoning Machine will accurately perform the following:

Multiplication, division, addition, subtraction, squaring and cubing. Has automatic devices which give a warning signal in case of wrong manipulation. Very compact and durable. All parts of the mechanism which are subjected to strain, are made of the hardest tool steel, so that the machine, with careful handling, will last a lifetime. The manipulation is so simple that the user can become familiar with same in a few minutes. Each machine fully guaranteed for two years. References from actual users can be had on application. Book of instructions with each machine.

2950 Saxonia Reckoning Machine, gives a product or dividend of 20 places, multiplier of 10, and quotient of 11 places.....each,	375.00
2951 Saxonia Reckoning Machine, gives a product or dividend of 16 places, multiplier of 8, and quotient of 9 places.....	300.00
2952 Saxonia Reckoning Machine, gives a product or dividend of 12 places, multiplier of 6, and quotient of 7 places.....	250.00
2954 Van Etten's Tables of Sines and Co-sines to 7 places of decimals, a useful companion to Reckoning Machines, for the use of Surveyors and Engineers.....	15.00

Universal Drafting Machine.



This article has now been on the market for a number of years and has proven to be an accurate, efficient and time-saving tool.

- | | | |
|------|--|---------|
| 2955 | Universal Drafting Machine, for drawings up to 18 x 24 inches....each, | \$30 00 |
| 2956 | Universal Drafting Machine, for drawings up to 24 x 36 inches.... " | 30.00 |
| 2957 | Universal Drafting Machine, for drawings up to 36 x 54 inches.... " | 30.00 |

Accessories.

- | | | | | | | | |
|----|------|---------|---------|-------|-----------|-------|--------|
| 24 | inch | Boxwood | Scales, | white | edge..... | each, | \$3.25 |
| 18 | " | " | " | " | "..... | " | 2 50 |
| 12 | " | " | " | " | "..... | " | 1.50 |
| 6 | " | " | " | " | "..... | " | 1.00 |

Furnished in any of the following divisions:

- Style A, 3, $1\frac{1}{2}$, $\frac{3}{4}$, $\frac{3}{8}$ inch to the foot.

- | | | | | | | | | | |
|---|----|---------------|-----------------|-----------------|---------------|---|---|---|---|
| " | B, | 1, | $\frac{1}{2}$, | $\frac{1}{4}$, | $\frac{1}{8}$ | " | " | " | " |
| " | C, | 3 | and | $1\frac{1}{2}$ | | " | " | " | " |
| " | D, | $\frac{3}{4}$ | " | $\frac{3}{8}$ | | " | " | " | " |
| " | E, | 1 | " | $\frac{1}{2}$ | | " | " | " | " |
| " | F, | $\frac{1}{4}$ | " | $\frac{1}{8}$ | | " | " | " | " |

- Style G, Full size and half size.

- " H, M M and $\frac{1}{2}$ M M.
 " J, 10 and 50 parts to the foot.
 " K, 20 " 40 " " " "
 " L, 30 " 60 " " " "

Straight Edges for Inking.

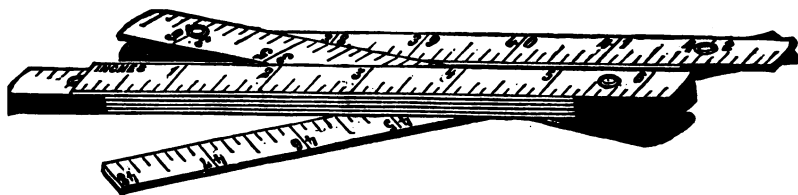
- | | |
|--------------------------------------|--|
| 36 inch, maple edge.....each, \$1.75 | 36 inch, celluloid edges . . .each, \$2.50 |
| 24 " " " " 1.25 | 24 " " " " 1.75 |
| 18 " " " " 1.00 | 18 " " " " 1.50 |
| 12 " " " " .75 | 12 " " " " 1.25 |

Complete Catalogue on application.

134714A



Pocket Folding Rules



Spring Folding Pocket Rules, with metal tips, $\frac{5}{8}$ inch wide, measuring 7 inches when closed.

White Enameled Finish

2960	3 ft. divided both sides, Feet, Inches and 1/16ths.....each,	\$.40
	4 ft. divided both sides, Feet, Inches and 1/16ths.....each,	.50
	5 ft. divided both sides, Feet, Inches and 1/16ths.....each,	.65
	6 ft. divided both sides, Feet, Inches and 1/16ths.....each,	.85
	8 ft. divided both sides, Feet, Inches and 1/16ths.....each,	1.10
2962	4 ft. one side Inches and 1/16ths, other side Millimeters, each,	.50
	6 ft. one side Inches and 1/16ths, other side Millimeters, each,	.85
2964	4 ft. one side Feet, Inches and 1/16ths; other side Feet, 10ths and 100ths .....	.50
	6 ft. one side Feet, Inches and 1/16ths; other side Feet, 10ths and 100ths .....	.85

Yellow Finish

2970	3 ft. divided both sides in Feet, Inches and 1/16ths.....each,	\$.25
	4 ft. divided both sides in Feet, Inches and 1/16ths.....each,	.35
	5 ft. divided both sides in Feet, Inches and 1/16ths.....each,	.45
	6 ft. divided both sides in Feet, Inches and 1/16ths.....each,	.55
	8 ft. divided both sides in Feet, Inches and 1/16ths.....each,	.75
2972	4 ft. one side Inches and 1/16ths; Millimeters on the other, .....	.35
	6 ft. one side Inches and 1/16ths; Millimeters on the other, .....	.55
2974	4 ft. one side Feet, Inches and 1/16ths; other side Feet, 10ths and 100ths.....each,	.35
	6 ft. one side Feet, Inches and 1/16ths; other side Feet, 10ths and 100ths.....each,	.55

Narrow Folding Rules

Spring Folding Rules, with metal tips, $\frac{3}{8}$ in. wide measuring 5 in. when closed.

White Enameled Finish

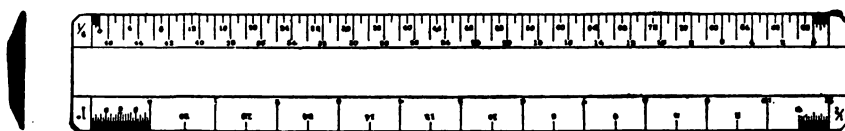
2980	2 ft. divided both sides, Inches and 1/16ths.....each,	\$.45
	3 ft. divided both sides, Inches and 1/16ths.....each,	.55
2982	3 ft. one side Inches and 1/16ths, other side Millimeters..each,	.55

Yellow Finish

2990	2 ft. divided both sides, Inches and 1/16ths.....each,	\$.25
	3 ft. divided both sides, Inches and 1/16ths.....each,	.40
2992	3 ft. one side Inches and 1/16ths, other side Millimeters, each,	.40

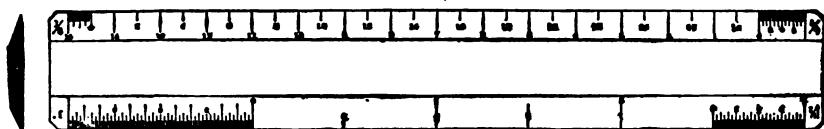
Flat Boxwood Scales.

U. S. Standard — Machine Divided.



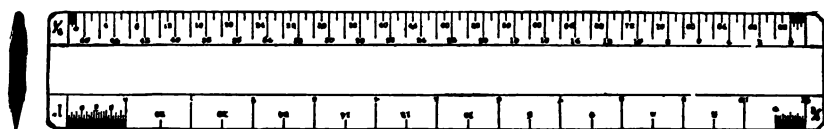
Flat Scales, divided $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 in. to the foot.

3072	6 in.....each,	\$.45	3082	White edges, 6 in...each,	\$.70
3073	12 in.....	" .70	3083	White edges, 12 in... "	1.15
3074	12½ in.....	" .80	3084	White edges, 12½ in... "	1.25
3078	18 in.....	" 1.35	3088	White edges, 18 in... "	2.10
3079	24 in.....	" 1.75	3089	White edges, 24 in... "	2.75



Flat Scales, divided $\frac{3}{8}$, $\frac{3}{4}$, 1½, 3 in. to the foot.

3119	6 in.....each,	\$.45	3129	White edges, 6 in...each,	\$.70
3120	12 in.....	" .70	3130	White edges, 12 in... "	1.15
3121	18 in.....	" 1.35	3131	White edges, 18 in... "	2.10
3122	24 in.....	" 1.75	3132	White edges, 24 in... "	2.75



Flat Scales, divided on both sides, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 in. and $\frac{3}{8}$, $\frac{3}{4}$, 1½, 3 in. to the foot.

3200	6 in.....each,	\$.80	3210	White edges, 6 in...each,	\$ 1.35
3202	12 in.....	" 1.10	3212	White edges, 12 in... "	2.00
3204	12½ in.....	" 1.35	3214	White edges, 12½ in... "	2.25
3206	18 in.....	" 2.15	3216	White edges, 18 in... "	3.40
3208	24 in.....	" 2.90	3218	White edges, 24 in... "	4.60

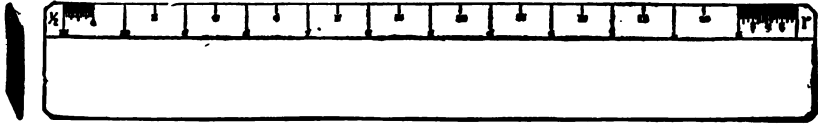
Paper Scales.

3215	Cardboard, 18 in. long, full divided, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, 1½, 3 in. to the foot, or 10, 20, 30, 40, 50, 60 parts to the inch.....each,	\$.20
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Only one kind of division on each scale.

Flat Boxwood Scales—Continued.

U. S. Standard—Machine Divided.



Flat Scales, divided $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 in. to the foot. (Opposite bevels.)

3230	12 in.....each, \$	.70	3240	White edge, 12 in each, \$	1.15
3234	12 $\frac{1}{2}$ in.....	“ .80	3244	White edge, 12 $\frac{1}{2}$ in..	“ 1.25

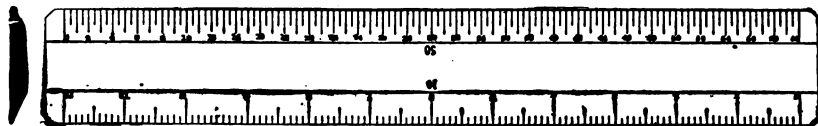
Flat Scales, $\frac{3}{8}$, $\frac{1}{2}$, 1 $\frac{1}{2}$, 3 in. to the foot. (Opposite bevels.)

3242	12 in.....each, \$.70	3252	White edge, 12 in...each, \$	1.15
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Flat Scale, divided 10x50 parts to the inch. (Opposite bevels.)

3280	12 in.....each, \$.70	3290	White edge, 12 in...each, \$	1.15
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Flat Scales, divided in decimal parts of inches.

					Each
3312	6 in., 10x 50.....each, \$.45	3322	White edge, 6 in., 10x 50.	\$.70
3313	6 in., 20x 40.....	“ .45	3323	White edge, 6 in., 20x 40.	.70
3314	6 in., 30x 60.....	“ .45	3324	White edge, 6 in., 30x 60.	.70
3315	6 in., 80x100.....	.70	3325	White edge, 6 in., 80x100.	.90
3316	12 in., 10x 50.....	“ .70	3326	White edge, 12 in., 10x 50.	1.15
3317	12 in., 20x 40.....	“ .70	3327	White edge, 12 in., 20x 40.	1.15
3318	12 in., 30x 60.....	“ .70	3328	White edge, 12 in., 30x 60.	1.15
3319	12 in., 80x100.....	1.00	3329	White edge, 12 in., 80x100.	1.50

Flat Scales, divided in decimal parts of feet.

3360	12 in., 100x 500.....each, \$	.80	3370	White edge, 100x 500, each, \$	1.25
3362	12 in., 200x 400.....	“ .80	3372	White edge, 200x 400, “	1.25
3364	12 in., 300x 600.....	“ .80	3374	White edge, 300x 600, “	1.25
3366	12 in., 800x1000.....	1.10	3376	White edge, 800x1000, “	1.50

Metric Scales

Machine Divided

Flat, divided on one side. Millimeters on one edge, and half Millimeters on the other:

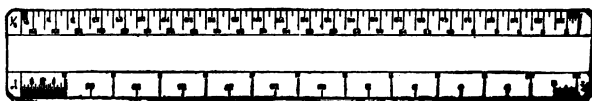
3400	Flat Boxwood Metric Scale, 10 cm. long (4 in.).....each,	\$.50
3401	Flat Boxwood Metric Scale, 20 cm. long (8 in.).....each,	.60
3402	Flat Boxwood Metric Scale, 30 cm. long (12 in.).....each,	.75
3403	Flat Boxwood Metric Scale, 50 cm. long (19¾ in.).....each,	1.40
3410	Flat Boxwood, white edge , Metric Scale, 10 cm. long.....each,	.75
3411	Flat Boxwood, white edge , Metric Scale, 20 cm. long.....each,	1.00
3412	Flat Boxwood, white edge , Metric Scale, 30 cm. long.....each,	1.25
3413	Flat Boxwood, white edge , Metric Scale, 50 cm. long.....each,	2.25

Triangular Metric Scales, divided one scale on each edge as follows:
.01, .02, .03, .05, .025, .0125:

3420	Triangular Boxwood Metric Scale, 20 cm. long (8 in.)....each,	\$.75
3421	Triangular Boxwood Metric Scale, 30 cm. long (12 in.)...each,	1.00
3422	Triangular Boxwood Metric Scale, 50 cm. long (19¾ in.)...each,	2.70
3430	Triangular Boxwood, white edge , Metric Scale, 20 cm. long.each,	2.00
3431	Triangular Boxwood, white edge , Metric Scale, 30 cm. long.each,	2.50
3432	Triangular Boxwood, white edge , Metric Scale, 50 cm. long.each,	5.00

Pocket Scales.

U. S. Standard—Machine Divided



Flat Scales, divided on both sides, 1/8, 1/4, 1/2, 1 and 3/8, 3/4, 1 1/2, 3 in. to the foot, extra small size, convenient to carry in the vest pocket:

3450	Boxwood, 6 in., in leather sheath.....each,	\$.65
3452	Boxwood, white edge, 6 in., in leather sheath.....each,	1.25
3454	Boxwood, 3 in., in leather sheath.....each,	.25

Flat Scales, divided on both sides, 10, 20, 30 and 50 parts to the inch, small size, convenient to carry in vest pocket:

3460	Boxwood, 6 in., in leather sheath.....each,	\$.65
3462	Boxwood, white edge, 6 in., in leather sheath.....each,	1.25
3464	Boxwood, 3 in., in leather sheath.....each,	.25

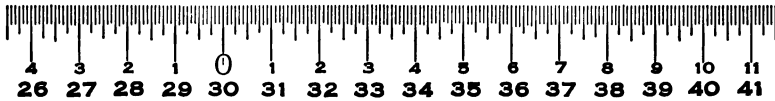
Beam Scale.

3500	Beam Scale , Boxwood, Double Beveled, 12 in. long. Convenient for figuring framing plans. Each edge has one scale reading from left to right, figured respectively, 14, 16, 18 and 20 inches on centers, laid out on a scale of 1/4 in. to the foot.....each,	\$1.20
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"Tubby" Scale

Designed by J. T. Tubby, Jr., Architect.



The new departure in this scale is that the divisions, instead of starting at either end, start at center of scale, at a point marked O (in red), from which the figures read right and left to the end of scale (divisions and figures in black). The usual inch subdivisions are graduated the full length of scale, so that feet and inches can be picked up at any part of same, thereby saving considerable time and insuring accuracy. In addition to the above another row of figures (in red) begins at extreme left and is carried to the right to the end.

By this arrangement the draughtsman avoids shifting the scale for each measurement, which means saving of time and energy.

By having the zero mark in the center (see illustration) it is exceedingly convenient for finding centers, or for laying out doors and windows and partitions from centers.

Made in a length of 15 inches. Opposite bevels, with white celluloid edges. One edge $\frac{1}{4}$ inch to the foot for scale drawings, other edge $\frac{3}{4}$ inch to the foot for details.

3510 "Tubby" Scale, white edges, opposite bevels, 15 in.....each, \$1.75
(Made to order with other scales as desired at short notice).

Scenic Artist's Scale.

3515 Flat Boxwood, 18 in. Each edge scale of $\frac{1}{2}$ in. to the foot, reading left to right and subdivided to full length scale, each, \$1.75

Miscellaneous Scales. (Opposite Bevels.)

3520	Boxwood, 12 in. long, divided $\frac{1}{16}$ and $\frac{1}{32}$ to inch.....each,	\$.70
3521	Boxwood, 12 in. long, divided $\frac{1}{32}$ and $\frac{1}{64}$ to inch.....each,	.70
3522	Boxwood, 12 in. long, divided $\frac{1}{16}$ to inch and metric.....each,	.70
3523	Boxwood, 12 in., full and half size; $\frac{1}{8}$ and $\frac{1}{4}$ size.....each,	.70
3524	Boxwood, 12½ in. long, divided $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$ and $\frac{3}{4}$ to inch..each	.75
3525	Boxwood, 12 in. long, divided one edge inches and $\frac{1}{16}$....each,	.20
3526	Boxwood, 18 in. long, divided one edge inches and $\frac{1}{16}$....each,	.75
3530	White Edges, 12 in. long, divided $\frac{1}{16}$ and $\frac{1}{32}$ to inch....each,	1.15
3531	White Edges, 12 in. long, divided $\frac{1}{32}$ and $\frac{1}{64}$ to inch....each,	1.15
3532	White Edges, 12 in. long, divided $\frac{1}{16}$ to inch and metric..each,	1.15
3533	White Edges, 12 in. full and half size; $\frac{1}{8}$ and $\frac{1}{4}$ size.....each,	1.15
3534	White Edges, 12½ in. long, divided $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$ and $\frac{3}{4}$ to inch	each 1.25

Indicator Sales for Measuring Indicator Diagrams.

Flat Boxwood Indicator Scales, 4 in. long, divided and beveled on one edge.

3540	3541	3542	3543	3544	3545	3546	3547	3548	3549	3550	3551
.12	.24	.32	.64	.10	.20	.30	.40	.50	.60	.80	100 parts to inch
\$.25	.25	.25	.25	.25	.25	.25	.25	.25	.25	.25	.25

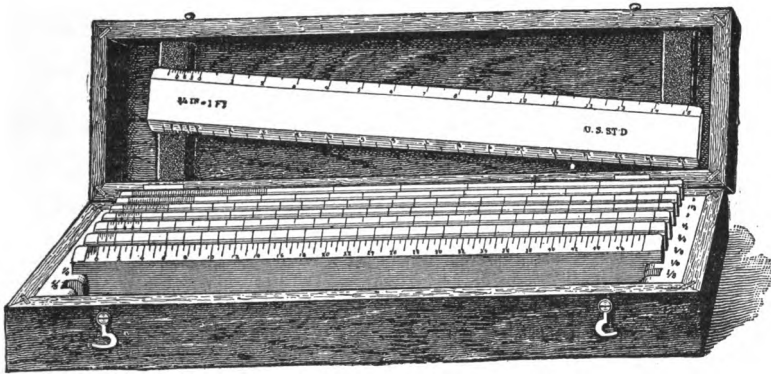
3555 Set of Indicator Scales, Nos. 3540-3551, in mahogany case (style of box same as No. 4000).....each, \$3.50

Triangular Boxwood Indicator Scales, 3in. long, divided on six edges.

3560	Divided 10, 15, 25, 30, 40, 70 parts to inch.....each,	\$.75
3561	Divided 10, 20, 25, 60, 80, 100 parts to inch.....each,	.75
3562	Divided 10, 20, 30, 40, 50, 60 parts to inch.....each,	.75
3563	Divided 12, 24, 32, 40, 60, 64 parts to inch.....each,	.75
3564	Divided 20, 40, 50, 60, 80, 100 parts to inch.....each,	.75

Metallic Paper. (See Page 191.)

Flat Boxwood Scales in Sets.
U. S. Standard—Machine Divided.



Set of 4 Scales in Case, divided $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1 in. to the foot.

4000	12 in.....each,	\$4.25	4010	White edge, 12 in...each,	\$6.25
4002	18 in.....	7.75	4012	White edge, 18 in.. "	10.75

Set of 8 Scales in Case, divided $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$, 3 in. to the foot.

4005	12 in.....each,	\$7.50	4015	White edge, 12 in..each,	\$11.50
4007	18 in.	14.25	4017	White edge, 18 in.. "	20.25

Set of 12 Scales in Case, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$, 2, 3, 4, 6 in. to the foot, and $\frac{1}{16}$ in. full size.

4020	12 in.....each,	\$11.00	4030	White edge, 12 in..each,	\$17.00
4022	18 in.....	21.00	4032	White edge, 18 in.. "	30.00

Set of 6 Scales in Case, divided 10, 20, 30, 40, 50, 60 parts to the inch.

4034	12 in.each,	\$6.00	4044	White edge, 12 in...each,	\$9.00
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Set of 8 Scales in Case, divided 10, 20, 30, 40, 50, 60, 80, 100 parts to the inch.

4036	12 in.....each,	\$9.00	4046	White edge, 12 in..each,	\$13.00
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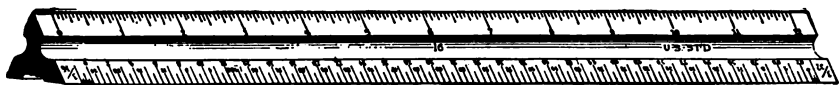
The above Scales, in Sets, are put up in nicely finished, hardwood boxes. The scales have the same divisions on both edges (one edge reading from right to left, the other edge reading from left to right.)

Other and special divisions at same price (send sketch for special divisions.)



Boxwood Triangular Scales

U. S. Standard—Machine Divided

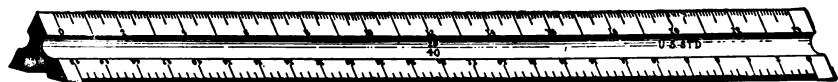


Triangular Scales, divided $\frac{3}{32}$, $\frac{3}{16}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$,
3 in. to the foot, and one edge 16 to the inch.

4050 6 in.....each, \$.50	4060 White edges, 6 in., each, \$1.25
4052 12 in.....each, .55	4062 White edges, 12 in., each, 2.00
4054 18 in.....each, 2.40	4064 White edges, 18 in., each, 4.00
4056 24 in.....each, 4.20	4066 White edges, 24 in., each, 6.00

Triangular Scales, divided $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, 1, $\frac{3}{8}$, $\frac{3}{4}$, $1\frac{1}{2}$, 3, 2 and
4 in. to the foot, and one edge 16 to the inch.

4058 12 in.....each, \$.55	4068 White edges, 12 in., each, \$2.00
4059 18 in.....each, 2.40	4069 White edges, 18 in., each, 4.00



Triangular Scales, divided 10, 20, 30, 40, 50, 60 parts to the inch.

4070 6 in.....each, \$.50	4080 White edges, 6 in., each, \$1.25
4072 12 in.....each, .55	4082 White edges, 12 in., each, 2.00
4074 18 in.....each, 2.40	4084 White edges, 18 in., each, 4.00
4076 24 in.....each, 4.20	4086 White edges, 24 in., each, 6.00

Triangular Scales, divided 20, 30, 40, 50, 60, 80 parts to the inch.

4092 12 in.....each, \$.90	5002 White edges, 12 in., each, \$2.25
4094 18 in.....each, 2.40	5004 White edges, 18 in., each, 4.00
4096 24 in.....each, 4.20	5006 White edges, 24 in., each, 6.00

Triangular Scales, divided 100, 200, 300, 400, 600 parts to the foot:

4097 12 in.....each, \$1.20	5007 White edges, 12 in., each, \$2.25
5010 Scale Guard, for triangular scales.....each, .15	

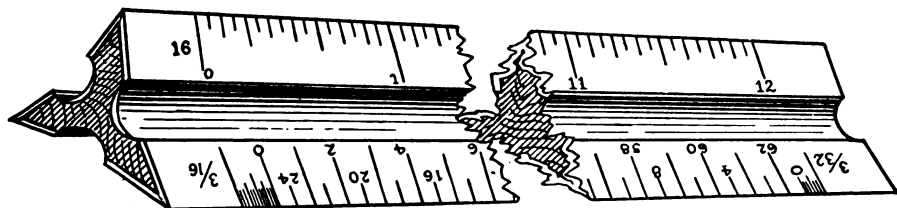


5014 Metal triangular scale, 12 in., same divisions as No. 4052, each, \$2.50	
5015 Metal triangular scale, 12 in., same divisions as No. 4058, each, 2.50	
5016 Metal triangular scale, 12 in., same divisions as No. 4072, each, 2.50	
5017 Metal triangular scale, 12 in., same divisions as No. 4092, each, 2.50	
5020 Improved metal scale, 12 in., one edge $\frac{1}{8}$, other edge $\frac{1}{4}$ in. to the foot .....each, 1.25	
5022 Improved metal scale, 12 in., one edge $\frac{1}{2}$, other edge $\frac{1}{4}$ in. to the foot .....each, 1.25	
5024 Improved metal scale, 12 in., one edge $\frac{3}{8}$, other edge $\frac{3}{16}$ to the foot .....each, 1.25	
5026 Improved metal scale, 12 in., one edge $\frac{3}{4}$, other edge $1\frac{1}{2}$ in. to the foot.....each, 1.25	
5028 Improved metal scale, 12 in., one edge $\frac{1}{2}$, other edge 1 in. to the foot .....each, 1.25	
5029 Improved metal scale, 12 in., one edge $1\frac{1}{2}$, other edge 3 in. to the foot .....each, 1.25	

"Fulton" Boxwood Triangular Scales

U. S. Standard—Machine Divided

The merits of this pattern are that only the extreme edges of the scale touch the paper or drawing, and that the scales are very easily read.



Triangular Scales, divided $\frac{3}{32}$, $\frac{3}{16}$, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$,
3 in. to the foot, and one edge 16 to the inch.

	Each		Each
4050F 6 in.....	\$.75	4060F White edges, 6 in...	\$1.50
4052F 12 in.....	1.00	4062F White edges, 12 in...	2.25
4054F 18 in.....	2.50	4064F White edges, 18 in...	4.50
4056F 24 in.....	4.50	4066F White edges, 24 in...	6.50

Triangular Scales, divided $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{8}$, $\frac{3}{4}$, 1, $1\frac{1}{2}$, 3, 2
and 4 in. to the foot, and one edge 16 to the inch.

	Each		Each
4058F 12 in.....	\$1.00	4068F White edges, 12 in...	\$2.25
4059F 18 in.....	2.50	4069F White edges, 18 in...	4.50

Triangular Scales, divided 10, 20, 30, 40, 50, 60 parts to the inch.

	Each		Each
4070F 6 in.....	\$.75	4080F White edges, 6 in...	\$1.50
4072F 12 in.....	1.00	4082F White edges, 12 in...	2.25
4074F 18 in.....	2.25	4084F White edges, 18 in...	4.50
4076F 24 in.....	4.50	4086F White edges, 24 in...	6.50

Triangular Scales, divided 20, 30, 40, 50, 60, 80 parts to the inch.

	Each		Each
4090F 6 in.....	\$.75	5000F White edges, 6 in...	\$1.50
4092F 12 in.....	1.25	5002F White edges, 12 in...	2.50
4094F 18 in.....	2.50	5004F White edges, 18 in...	4.50
4096F 24 in.....	4.50	5006F White edges, 24 in...	6.50

Triangular Scales, divided 100, 200, 300, 400, 500, 600 parts to the foot.

	Each		Each
4097F 12 in.....	\$1.50	5007F White edges, 12 in...	\$2.50



Parallel Rules



5085 German Silver Rolling Parallel Rule:

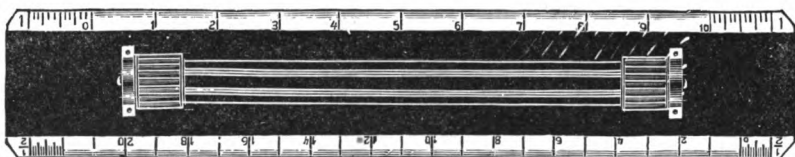
	9	12	15	18	24 inches
Each	\$8.50	10.00	12.00	15.00	20.00

5090 Black Celluloid Rolling Parallel Rule:

	9	12	15	18 inches
Each,.....	\$3.50	4.25	5.00	6.00

5095 Ebony Rolling Parallel Rule:

	9	12	15	18 inches
Each	\$2.70	3.25	3.90	4.80



5100 Hardwood Rolling Parallel Rule, brass mountings, white edges, divided $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$ and inch scales:

	12	15	18 inches
Each,.....	\$5.00	6.50	7.50

Folding Parallel Rules



5105 Celluloid Folding Parallel Rule, nickel plated bars:

	6	9	12	15	18	24 inches
Each.....	\$1.35	1.80	2.40	3.00	3.75	4.90

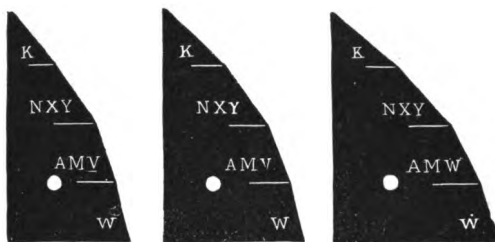
5110 Black Celluloid Folding Parallel Rule, nickel plated bars:

	6	9	12	15	18	24 inches
Each	\$.75	.90	1.20	1.50	1.75	2.40

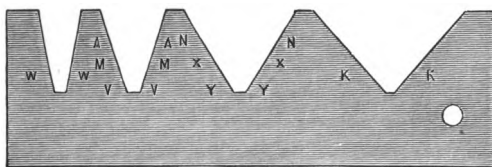
5115 Ebony Folding Parallel Rule, nickel plated bars:

	6	9	12	15	18	24 inches
Each	\$.30	.60	.75	.90	1.20	2.10

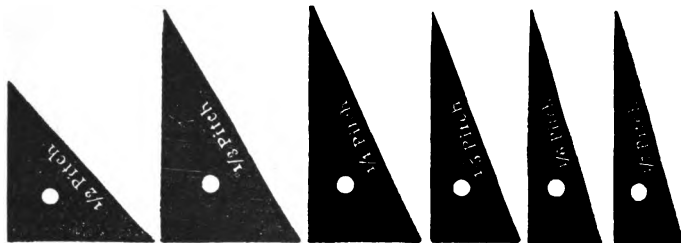
Lettering Triangles and Templates



- 5125 Lettering Triangles, of black celluloid, 3 in set.....per set, \$1.20
 5126 Lettering Triangles, of transparent celluloid, 3 in set..per set, 1.50

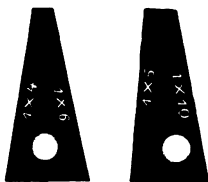


- 5130 Lettering Triangles, of black celluloid, 3 in set.....per set, \$1.40
 5131 Lettering Templates, of transparent celluloid, 3 in set..per set, 1.50



- 5135 Triangles, for roof pitches, black celluloid, 6 in set....per set, \$2.50
 5136 Triangles, for roof pitches, of transparent celluloid,
 6 in setper set, 3.00

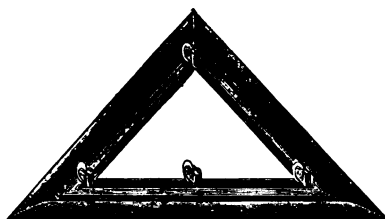
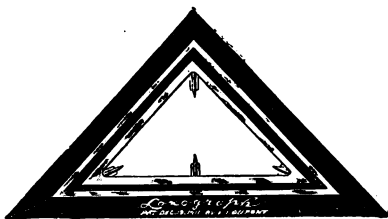
Embankment Triangles



- 1 x 4 in. 1 x 5 in. 1 x 6 in. 1 x 8 in. 1 x 10 in. 1 x 12 in.
 5138 Triangles, for embankments, of black celluloid, 3 in set,
 6 slopesper set, \$2.25
 5139 Triangles, for embankments, of transparent celluloid,
 3 in set, 6 slopes.....per set, 4.50



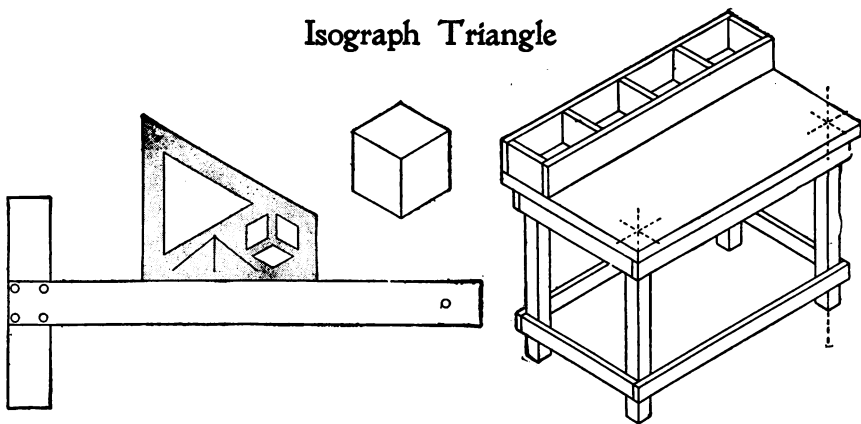
Loxograph Triangles



Do away with the annoyance of waiting for ink lines to dry before drawing intersecting or adjoining lines. Mounted on small steel wheels (see cut), which raise the triangle off the drawing just high enough to clear the same. The edges of the steel wheels are so fine that they will not pick up or blur freshly inked lines when the triangle is run through or over these lines. An additional advantage is that the triangle will not collect on its edges the fuzz or dust which is so annoying in triangles that lie flat on the drawing and frequently cause blots.

- 5140 Metallic Loxograph, 45°, 5¾ in., consists of a blackened metallic frame with raised nickel plated ridges, the wheels being set in this frame. Packed in fine artificial leather lined oak caseeach, \$2.50
- 5141 Letonite Loxograph, 45°, 5¾ in., consists of a steel frame, nickel plated and highly polished, in which the wheels are set. This frame holds an outside frame of Letonite, a black material similar to hard rubber. Packed in fine leather lined mahogany case.....each, \$3.75
- 5142 Letonite Loxograph, 45°, 10 in., same as No. 5141.....each, 5.00

Isograph Triangle

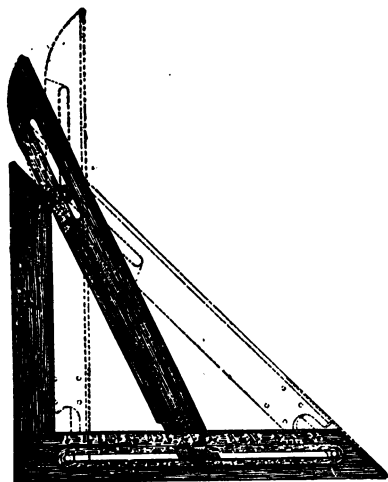


The Isograph in Use

A very ingenious and novel instrument for making drawings in Isometric perspective, which means that all lines, although apparently in perspective, are actual size in the scale to which the drawing is made. Useful for working drawings, as the article drawn is shown in three dimensions and every distance can be measured to scale on the drawing itself.

- 5145 Isograph Triangle, made of transparent celluloid, 6x6 in....each, \$.50

Adjustable Triangle



A 45° triangle, made of maple with German Silver trimmings, which can instantly be adjusted to any possible degree and then clamped by means of a thumb screw. Perfectly flush and can be used on either side. Every half degree from 0° to 45° is marked on the base of the triangle.

The following slopes are indicated on the base, 1:1½, 1:2, 1:2½, 1:3, 1:4, 1:5, 1:6, 1:8, 1:12, 3:4.

For lettering the slopes of A, K, M, N, V, W, X, Y are indicated on the lower edge of the triangle, and the hypotenuse can be adjusted accordingly.

There are no better and quicker means for repeating odd angles or for transplanting same from one board to another. There is not a single branch of the draughting profession where the use of this triangle will not be appreciated.

5147 Adjustable Triangle, 11 inch as described above.....each, \$3.50

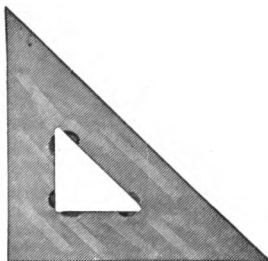
Repairs of Triangles

Trueing up edges and angles of wooden and celluloid triangles.

30°x60°	6-8	9-10	11-13	14-18	19-21	22-24 inch
45°	5-7	8-9	10-11	12-14	15-18	20-24 "
Each,	\$.20	.25	.30	.35	.45	.65



Transparent Celluloid Triangles, with Notches



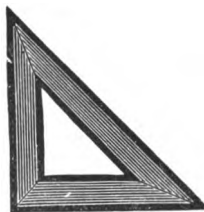
These notches greatly facilitate the picking up of the triangle and thereby lessen the liability to blur fresh ink lines.

5150	30° x 60°	4	5	6	7	8	9	10	11	12	14	16	18 in.
	Each	.....\$	.25	.30	.35	.40	.50	.55	.65	.75	.90	1.25	1.55 2.10

5152	45°	3	4	5	6	7	8	9	10	11	12	13	14	16 in.
	Each	\$.25	.35	.40	.50	.60	.70	.80	.85	1.15	1.40	1.55 1.70 2.20	

5154	22½° x 67½°	4	6	8	10	12	14	16 in.
	Each	.....\$	.25	.35	.50	.65	.90	1.25 1.55

Mahogany Triangles, Ebony Lined



5160	30° x 60°	6	8	10	12	14	16	18	20 in.
	Each	....\$	.40	.50	.60	.85	1.05	1.25	1.50 1.80

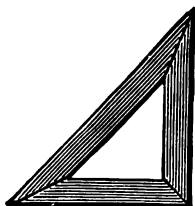
5163	45°	5	7	9	11	13	15	17 in.
	Each	....\$	.40	.50	.60	.85	1.05	1.35 1.65

Black Celluloid Triangles



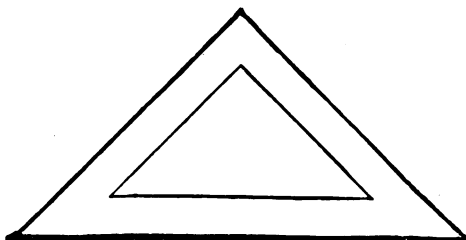
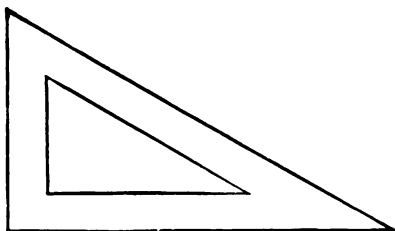
5165	30° x 60°	6	8	10	12	14	16 in.
	Each	\$.25	.35	.45	.60	.85	1.70
5167	45°	5	7	9	11	13 in.	
	Each	\$.30	.40	.50	.70	1.05	

Maple Triangles



5170	30° x 60°	6	8	10	12	14 in.
	Each	\$.13	.16	.20	.24	.29
5173	45°	5	7	9	11	13 in.
	Each	\$.13	.16	.20	.24	.30

Steel Triangles, Nickel Plated



5175	30° x 60°	6	7	8	10½	15 in.
	Each	\$3.20	3.50	3.85	4.25	6.50
5177	45°	5	6½	8	10	12 in.
	Each	\$3.20	3.50	4.25	5.50	6.50



Straight Edges

Celluloid Straight Edges

Made of Maple, lined on both sides with transparent celluloid.

5180	Square Edges,	18	24	30	36	42	48	60 in
	Each	\$.75	1.00	1.25	1.50	1.80	2.20	4.00

Mahogany, Ebony Lined, Straight Edges

5185	Square Edges,	30	36	42	48	60	72 in
	Each	\$.50	.55	.70	.85	1.25	1.40

Ashwood, Maple Lined, Straight Edges

5190	One edge beveled,	30	36	42	48	60	72	84	96	120 in.
	Each	\$.40	.45	.55	.65	.90	1.00	2.75	3.75	5.00

Cherry Straight Edges.

5195	One edge beveled,	24	30	36	42	48	60 in.
	Each	\$.25	.30	.35	.40	.50	.75

Steel Straight Edges, Nickel Plated

6000	One edge beveled,	18	24	30	36	42	48	60	72 in.
	Width	1¼	1½	1¾	2	2¼	2½	2¾	3 in.
	Thickness.....	.072	.077	.083	.083	.100	.100	.125	.156 in.
	Each	\$2.00	3.00	4.00	5.00	6.50	8.00	11.00	15.00

Light Steel Straight Edges.

6005 Made of 16 gauge Spring Steel 1¼ in. wide. Graduated on one side.
One edge to inches and 16ths, other edge to inches and ½ths.
Bright Surface, Black Figures, Distinct and Clear.

	24	36	48	60	72 in.
Each	\$1.25	1.85	2.35	4.00	5.00

Repairs of Straight Edges and T Squares

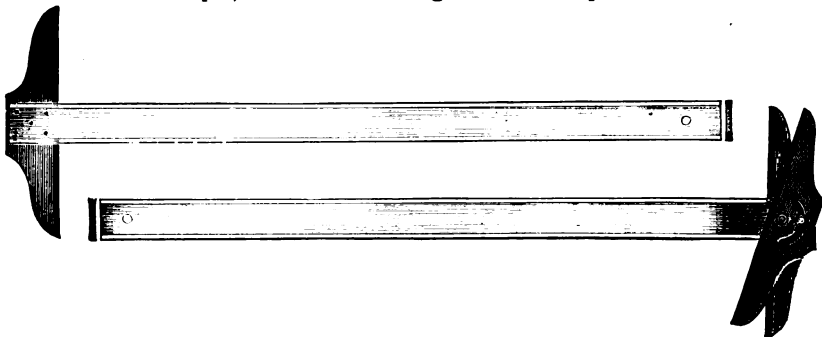
Of Wood or Celluloid.

Truing up Straight Edges on both edges. On T Squares truing up head and blade:

	24	30	36	42	48	54	60	72	84 in.
Straight edges \$	.20	.20	.25	.30	.35	.45	.55	.65	.75
T Squares	.35	.40	.45	.50	.60	.75	.90	1.00	1.25

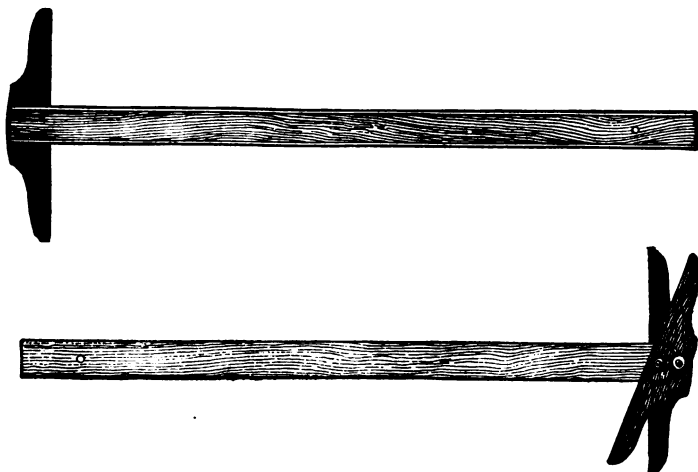
Celluloid T Squares

Made of Maple, lined on both edges with transparent celluloid.



6010	Fixed head,	12	18	21	24	30	36	42	48	54	60 in.
	Each	\$.75	.90	1.10	1.25	1.50	1.75	2.00	2.50	4.00	5.00
6011	Shifting Head,	18	24	30	36	42	48	54	60 in.		
	Each	\$1.65	2.10	2.40	2.70	3.00	3.60	5.25	6.25		

Ashwood, Maple Lined, T Squares



6015	Fixed Head,	12	21	24	30	36	42	48	54	60	72 in.
	Each	\$.25	.40	.50	.60	.75	.95	1.10	1.50	2.25	2.50
6016	Shifting Head,	24	30	36	42	48	54	60	72 in.		
	Each	\$1.30	1.40	1.50	1.65	1.85	2.25	2.90	3.50		

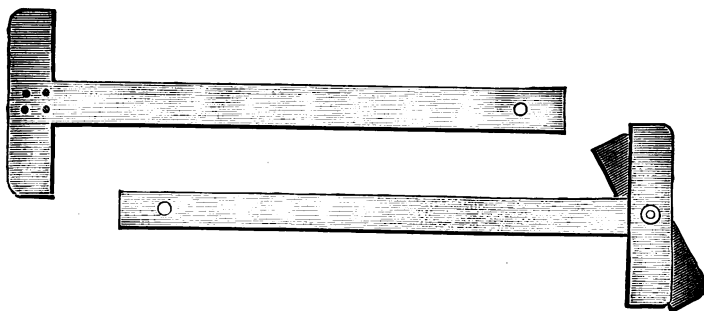


Mahogany, Ebony Lined, T Squares



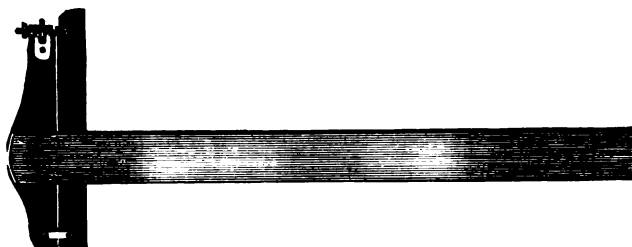
6020	Fixed Head,	24	30	36	42	48	54	60 in.
	Each	\$.70	.80	.95	1.10	1.50	2.15	2.50
6021	Shifting Head,	24	30	36	42	48	54	60 in.
	Each	\$1.40	1.50	1.65	1.90	2.50	3.15	3.75

Cherry T Squares



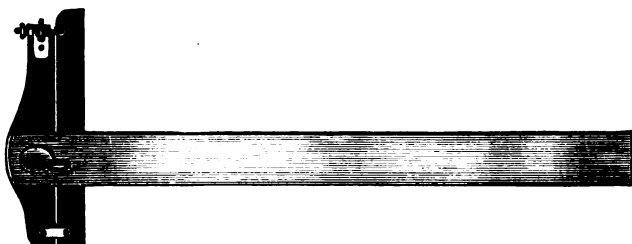
6025	Fixed Head,	15	18	21	24	30	36	42	48	54 in.
	Each	\$.15	.20	.22	.25	.30	.40	.45	.65	1.00
6026	Shifting Head,	15	18	21	24	30	36	42	48	54 in.
	Each	\$.50	.55	.60	.65	.70	.80	.85	1.10	1.40

T Squares with Patent Micrometer Adjustment



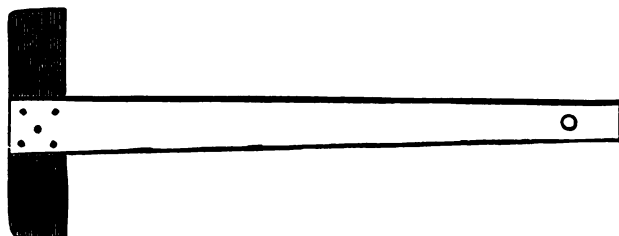
6030	Mahogany, ebony lined, 24	30	36	42	48	54	60 in.	
	Each	\$1.65	1.90	2.15	2.40	2.65	3.15	3.65
6031	Maple, celluloid lined, 24	30	36	42	48	54	60 in.	
	Each	\$2.50	2.85	3.25	3.70	4.35	5.00	6.50

T Squares with Patent Micrometer Adjustment and Clamping Swivel



6035	Mahogany, ebony lined, 24	30	36	42	48	54	60 in.	
	Each	\$2.50	2.65	2.90	3.15	3.40	3.90	4.40
6036	Maple, celluloid lined, 24	30	36	42	48	54	60 in.	
	Each	\$3.15	3.50	3.90	4.35	5.00	6.00	8.00

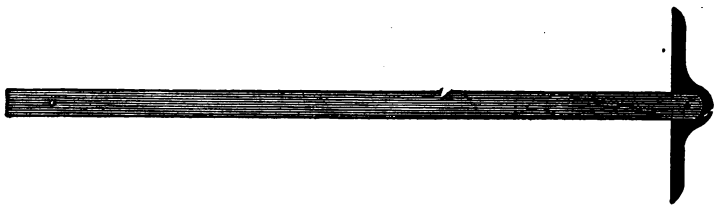
Tapered T Squares, One Edge Beveled



6040	Maple Blade, walnut head,	30	36	42	48	54	60 in.
	Each	\$.80	1.00	1.20	1.50	2.00	2.50
6041	Mahogany, Ebony Lined....	1.20	1.40	1.60	1.85	2.25	2.75

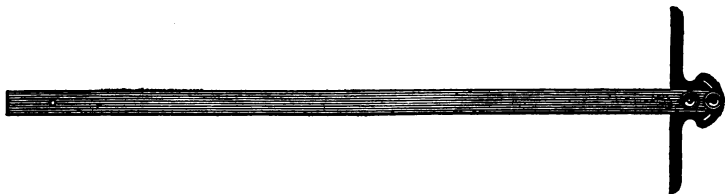


Steel T Squares



6045 Steel T Square, nickel plated steel blade, fixed enameled steel head:

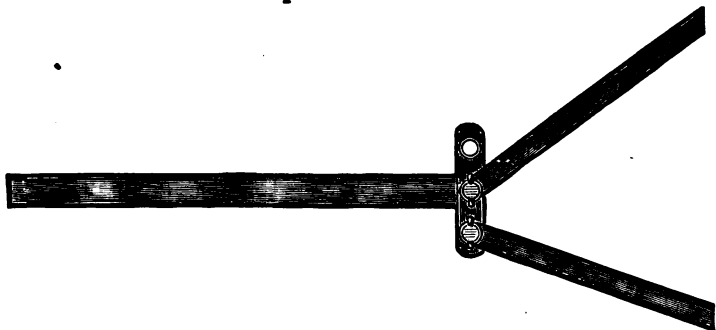
Length	18	24	30	36	42 in.
Width	1¼	1¼	1½	1½	1¾
Each	\$3.00	3.50	4.50	5.50	6.50



6046 Steel T Square, nickel plated steel blade, shifting head of enameled steel and nickel plated swivel:

Length	18	24	30	36	42 in.
Width	1¼	1¼	1½	1½	1¾
Each	\$4.25	4.75	5.75	6.75	7.75

Perspective Lineads



6055 Perspective Linead, maple, 24 in., arms 10 in. long.....each, \$3.00

6056 Perspective Linead, maple, 30 in., arms 11 in. long..... " 3.50

6057 Perspective Linead, maple, 36 in., arms 12 in. long..... " 4.00

Adjustable Curve Rulers



6060 Patent Adjustable Curve Ruler, 14½ in.....each, \$2.25



6061 Patent Adjustable Curve Ruler, 30 in.....each, \$3.75



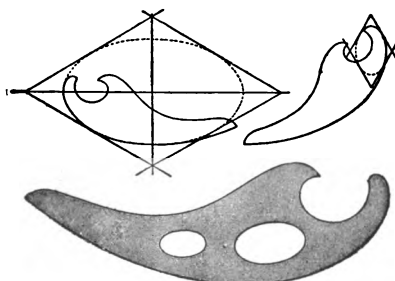
6062 Patent Adjustable Curve Ruler, 12 in.....each, \$1.25

6062½ Patent Adjustable Curve Ruler, 24 in..... " 1.90



6063	Patent Adjustable Curve Ruler,	7	15	31 in.
	Each	\$.45	.98	1.87

Isograph Elliptic French Curve



6064 Isograph Elliptic French Curve.....each, \$.50

An 8 inch curve of transparent celluloid, scientifically designed for drawing any size of isometric ellipses. As shown above, the curve draws one quarter of the ellipse, and is then shifted to the other three quarters. The smaller inside ellipses are for non-scale and free hand work. Will fit all sizes of ellipses as well as those shown in illustration. Besides its use for ellipses, it is suitable for general draughting.



Splines and Spline Weights



6065	Weights for Splines, with finger.....each, \$.85								
		18	24	30	36	42	48	60	in.
6066	Wood Splines .....ea., \$.12	.15	.20	.25	.30	.35	.45		
6067	Black Celluloid Splines.....ea.,	.20	.25	.35	.40	.45	.50	.75	
6068	Transparent Celluloid Splines.ea.,	.35	.40	.45	.50	.55	.60		

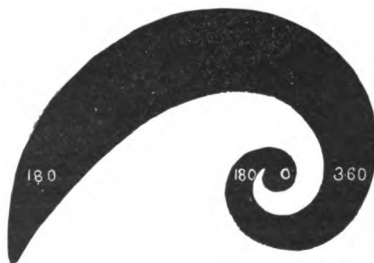
Combination Curves



6070-6071

6070	Combination Curve, Black Celluloid.....each, \$.75	
6071	Combination Curve, Transparent Celluloid.....each, 1.00	

Spiral Curves

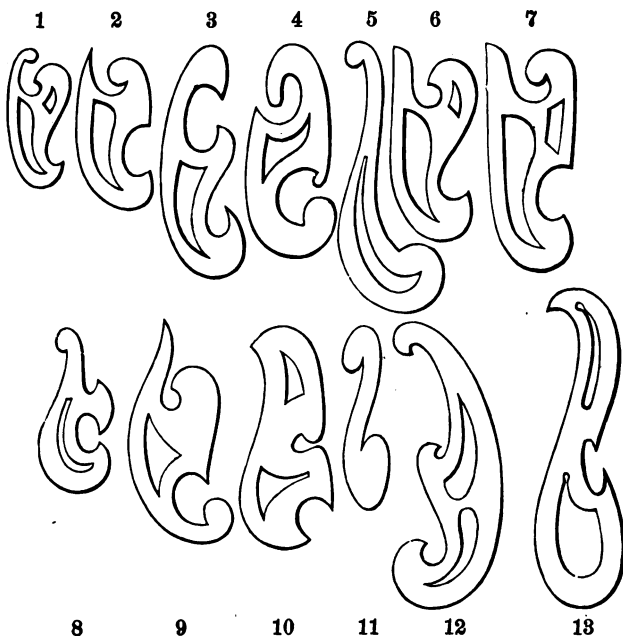


6075-6076

6075	Black Celluloid Spiral Curve.....each, \$1.25	
6076	Transparent Celluloid Spiral Curve.....each, 1.75	

Irregular Curves

Illustrations 1/6 actual size.



Wood Curves

6080 Wood Curves:

	1	2	3	4	5	6	7	8	9	10	11	12	13
Each, \$	.20	.25	.30	.30	.30	.25	.30	.25	.30	.30	.20	.40	.45

Black Celluloid Curves

6082 Black Celluloid Curves:

	1	2	3	4	5	6	7	8	9	10	11	12	13
Each, \$	.30	.40	.45	.45	.45	.40	.45	.30	.45	.45	.30	.75	1.00

Transparent Celluloid Curves

6084 Transparent Celluloid Curves:

	1	2	3	4	5	6	7	8	9	10	11	12	13
Each, \$	.35	.45	.55	.55	.55	.55	.55	.35	.55	.60	.35	.90	1.35



Copenhagen Ship Curves



6085 Of Wood, set of 45 curves, in case.....per set, \$16.50

6087 Of Black Celluloid, set of 45 curves, in case..... " 27.00

6089 Of Transparent Celluloid, set of 45 curves, in case..... " 31.50

For Prices of Single Curves see page 127.

Copenhagen Ship Curves—Continued

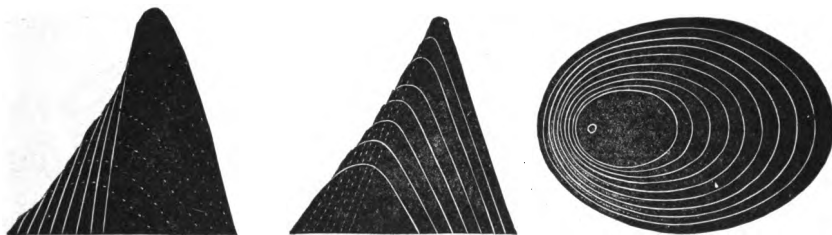
Single Curves, 1- 9, of wood, \$	.70.	of black celluloid, \$	.95.	of celluloid, \$1.15
Single Curves, 10-16, of wood, .50.	of black celluloid, .50.	of celluloid, .60		
Single Curves, 17-27, of wood, .40.	of black celluloid, .35.	of celluloid, .45		
Single Curves, 28-45, of wood, .30.	of black celluloid, .25.	of celluloid, .35		

Curves for Mechanical Engineers



6090	Wood, set of 10 curves, in box.....	per set, \$3.20
6092	Black Celluloid, set of 10 curves, in box.....	per set, 3.75
6094	Celluloid, set of 10 curves, in box.....	per set, 4.80

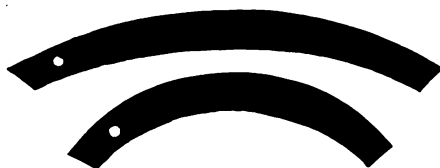
Hyperbolas, Parabolas and Ellipses



6095	Hyperbolas, 8 in set, from 2 to 5½ inches:	Per Set
	Celluloid, per set, \$2.75, Black Celluloid, per set, \$2.25	Wood, \$1.50
6096	Parabolas, 8 in set, from 1¼ to 5½ inches:	
	Celluloid, per set, \$2.75, Black Celluloid, per set, 2.25	Wood, 1.50
6097	Parabolas, 8 in set, from 3¼ to 14¼ inches:	
	Celluloid, per set, \$6.00, Black Celluloid, per set, 5.50	Wood, 3.00
6098	Ellipses, 6 in set, from 2 to 4½ inches:	
	Celluloid, per set, \$2.25 Black Celluloid, per set, 1.50	Wood, 1.25
6099	Ellipses, 8 in set, from 1½ to 6 inches:	
	Celluloid, per set, \$4.00 Black Celluloid, per set, 2.50	Wood, 2.00
6100	Ellipses, 10 in set, from 2 to 8 inches:	
	Celluloid, per set, \$5.00 Black Celluloid, per set, 3.50	Wood, 2.50



Railroad Curves



- 6105 Black Celluloid Railroad Curves**, 10 in. set, 12-120 inch radius, viz.:
 12, 24, 36, 48, 60, 72, 84, 96, 108, 120, in wooden box..... **\$6.50**
 Per Set
- 6106 Transparent Celluloid Railroad Curves**, same as in 6105, in box **9.50**
- 6108 Black Celluloid Railroad Curves**, 17 in set, 12-60 inch radius, viz.:
 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60
 inches, in wooden box..... **12.00**
- 6110 Transparent Railroad Curve**, same as in 6108, in box..... **15.00**
- 6111 Black Celluloid Railroad Curves**, 40 in set, 3-120 inch radius, viz.:
 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18, 21, 24, 27, 30, 33,
 36, 39, 42, 45, 48, 51, 54, 57, 60, 66, 72, 78, 84, 90, 96, 102, 108,
 114, 120 inches radius, and 1 curve 1° to 100 feet scale=57.30
 inches; 1 curve 2° to 100 feet scale=28.65 inches, in wooden
 box **25.00**
- 6112 Transparent Celluloid Railroad Curves**, same as in No. 6111, in
 box **38.00**



- 6115 Black Celluloid Railroad Curves, with Tangent**, 41 in set, marked in
 degrees and inches to scale, 100 feet=1 inch, viz.:

0°.30'=114.59 in.	3°.30'=16.37 in.	6° =9.55 in.	8°.30'=6.75 in.
1° = 57.30 in.	3°.45'=15.28 in.	6°.15'=9.17 in.	8°.45'=6.55 in.
1°.15'= 45.84 in.	4° =14.33 in.	6°.30'=8.82 in.	9° =6.37 in.
1°.30'= 38.20 in.	4°.15'=13.48 in.	6°.45'=8.49 in.	9°.15'=6.20 in.
1°.45'= 32.74 in.	4°.30'=12.73 in.	7° =8.19 in.	9°.30'=6.04 in.
2° = 28.65 in.	4°.45'=12.07 in.	7°.15'=7.91 in.	9°.45'=5.88 in.
2°.15'= 25.47 in.	5° =11.46 in.	7°.30'=7.64 in.	10° =5.74 in.
2°.30'= 22.92 in.	5°.15'=10.92 in.	7°.45'=7.40 in.	10°.30'=5.48 in.
2°.45'= 20.84 in.	5°.30'=10.42 in.	8° =7.17 in.	11° =5.22 in.
3° = 19.10 in.	5°.45'= 9.97 in.	8°.15'=6.95 in.	11°.30'=4.99 in.
3°.15'= 17.63 in.	Above, complete, in wooden box..per set, \$30.00		

- 6117 Transparent Celluloid Railroad Curves, with tangent**, 41 in set,
 same as in No. 6115, in box.....per set **\$40.00**

Single Black Celluloid Railroad Curves, with tangent....each,	.90
Single Black Celluloid Railroad Curves, without tangent..each,	.75
Single Transparent Celluloid R. R. Curves, with tangent.each,	1.20
Single Transparent Celluloid R. R. Curves, without tangent.each,	1.00

Wooden Railroad Curves.

- 6120 Wooden Railroad Curves**, 10 in set, 12-120 inch radius, viz.:
12, 24, 36, 48, 60, 72, 84, 96, 108, 120, in wooden box.....per set, \$3.50
- 6122 Wooden Railroad Curves**, 17 in set, 12-60 inch radius, viz.:
12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60 in. " 6.00
- 6124 Wooden Railroad Curves**, 44 in set, 3-200 inch radius, viz.:
3, 3½, 4, 4½, 5, 5½, 6, 6½, 7, 7½, 8, 8½, 9, 9½, 10, 12, 14, 16, 18, 20, 22,
24, 27, 30, 33, 36, 39, 42, 48, 54, 60, 66, 72, 78, 84, 90, 100, 110, 120,
130, 140, 160, 180, 200 in., in wooden box..... " 12.00
Single Wooden Curves.....each, .50

Metal Railroad Curves.

Finished with the same radius on both edges.

- 6126 Metal Railroad Curves**, 100 in set, 2-300 inch radius, viz.:
2, 2½, 2¾, 3, 3½, 3¾, 4, 4½, 4¾, 5, 5½, 5¾, 6, 6½, 6¾, 7, 7½, 7¾, 8, 8½, 8¾, 9, 9½, 9¾, 10, 10½, 10¾, 11, 11½, 11¾, 12, 12½, 12¾, 13, 13½, 14, 14½, 15, 15½, 16, 16½, 17, 17½, 18, 18½, 19, 19½, 20, 20½, 21, 21½, 22, 22½, 23, 23½, 24, 24½, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 40, 42, 44, 46, 48, 50, 55, 60, 65, 70, 80, 90, 100, 120, 140, 160, 200, 240, 300, complete set of 100 curves.....per set, \$27.50
Any of above curves, 75 in set " 22.50
Any of above curves, 50 in set " 16.75
Any of above curves, 25 in set " 9.60

- 6128 Metal Railroad Curves**, 102 in set, marked in degrees and inches to scale, 100 feet to 1 inch, viz.:

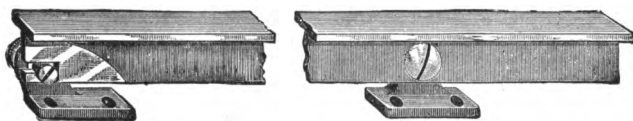
0° 15' = 229.18	2° = 28.65	4° 10' = 13.75	7° 30' = 7.64	11° 45' = 4.88	17° = 3.38
0° 20' = 171.89	2° 10' = 26.45	4° 15' = 13.48	7° 45' = 7.40	12° = 4.78	17° 30' = 3.29
0° 25' = 137.51	2° 15' = 25.47	4° 20' = 13.23	8° = 7.17	12° 15' = 4.69	18° = 3.20
0° 30' = 114.59	2° 20' = 24.56	4° 30' = 12.74	8° 15' = 6.95	12° 30' = 4.59	18° 30' = 3.11
0° 35' = 98.22	2° 30' = 22.92	4° 40' = 12.28	8° 30' = 6.75	12° 45' = 4.50	19° = 3.03
0° 40' = 85.94	2° 40' = 21.49	4° 45' = 12.07	8° 45' = 6.55	13° = 4.42	19° 30' = 2.95
0° 45' = 76.39	2° 45' = 20.84	4° 50' = 11.86	9° = 6.37	13° 15' = 4.33	20° = 2.88
0° 50' = 68.76	2° 50' = 20.22	5° = 11.46	9° 15' = 6.20	13° 30' = 4.25	21° = 2.74
0° 55' = 62.60	3° = 19.16	5° 15' = 10.92	9° 30' = 6.04	13° 45' = 4.18	22° = 2.62
1° = 57.30	3° 10' = 18.10	5° 30' = 10.42	9° 45' = 5.88	14° = 4.10	23° = 2.51
1° 10' = 49.11	3° 15' = 17.63	5° 45' = 9.97	10° = 5.74	14° 15' = 4.03	24° = 2.40
1° 15' = 45.84	3° 20' = 17.19	6° = 9.55	10° 15' = 5.60	14° 30' = 3.96	25° = 2.31
1° 20' = 42.97	3° 30' = 16.37	6° 15' = 9.17	10° 30' = 5.45	14° 45' = 3.90	26° = 2.22
1° 30' = 38.20	3° 40' = 15.63	6° 30' = 8.82	10° 45' = 5.34	15° = 3.83	27° = 2.14
1° 40' = 34.38	3° 45' = 15.28	6° 45' = 8.49	11° = 5.22	15° 30' = 3.71	28° = 2.07
1° 45' = 32.74	3° 50' = 14.95	7° = 8.19	11° 15' = 5.10	16° = 3.59	29° = 2.00
1° 50' = 31.25	4° = 14.33	7° 15' = 7.91	11° 30' = 4.99	16° 30' = 3.48	30° = 1.93

- Complete set of 102 curvesper set, \$30.00
Any of above curves, 75 in set " 24.25
Any of above curves, 50 in set " 18.00
Any of above curves, 25 in set " 10.50

Boxes for metal curves, extra, \$2.00 to \$4.00.



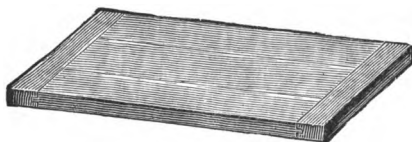
Adjustable Steel Edge for Drawing Boards



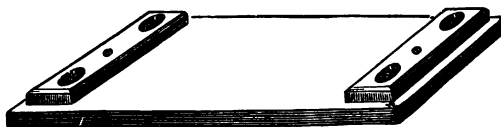
Ground perfectly straight and true and are nickel plated. With attachments to fasten to end of drawing board.

6130	23	30	36	40	48	60 in.
Each	\$2.90	3.50	4.00	4.35	5.00	6.00

Pine Drawing Boards



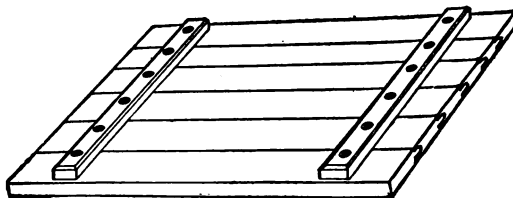
6160	12x17 in., end battens, flush both sides.....	each, \$.65
6161	16x21 in., end battens, flush both sides.....	" .95
6162	18x24 in., end battens, flush both sides.....	" 1.15
6163	20x26 in., end battens, flush both sides.....	" 1.25
6164	23x31 in., end battens, flush both sides.....	" 1.75
6165	31x42 in., end battens, flush both sides.....	" 3.50



Hardwood ledges screwed to the back of the board. Screws set in oval washers to allow contraction or expansion.

6170	6172	6174	6176	6178	6179	6180
12x17 in.	16x21 in.	18x24 in.	20x26 in.	23x31 in.	25x37 in.	31x42 in.
Each... \$1.10	1.50	1.95	2.20	2.80	4.00	4.25

Detail Drawing Boards

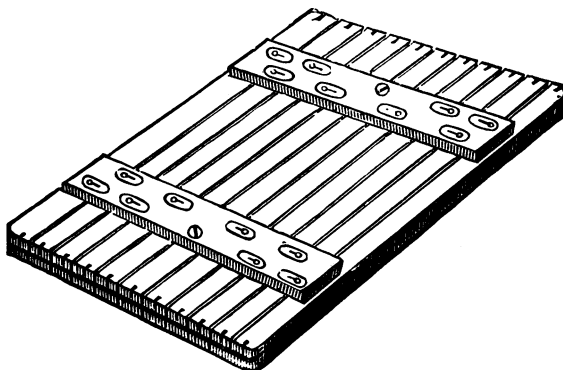


All of these boards are made from selected and thoroughly seasoned soft wood. They are made of narrow strips, tongued and grooved and firmly glued together. All boards shellacked. Best quality guaranteed. Hardwood cleats on back secured by screws and slot washers.

No. 6182	No. 6183	No. 6184	No. 6190	No. 6192
37 x 48	37 x 54	37 x 60	42 x 72	42 x 84
\$6.50	\$8.00	\$9.00	\$13.00	\$20.00
No. 6193	No. 6195	No. 6196	No. 6197	
42 x 96	48 x 84	48 x 96	48 x 108	
\$22.50	\$25.00	\$28.00	\$31.00	

Larger or odd size boards made to order at short notice. Crating of boards charged extra at cost.

White Pine Drawing Boards

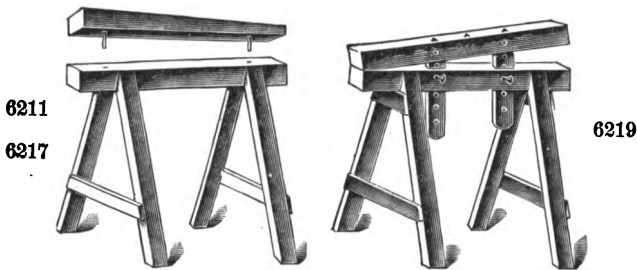


Superfine grooved back, hardwood ledges screwed to the back of the board.

	6204	6205	6206	6207	6208	6209
	16x21 in.	20x26 in.	23x31 in.	31x42 in.	36x48 in.	36x60 in.
Each	\$2.50	3.20	4.00	6.50	9.00	12.00



Horses, for Drawing Boards



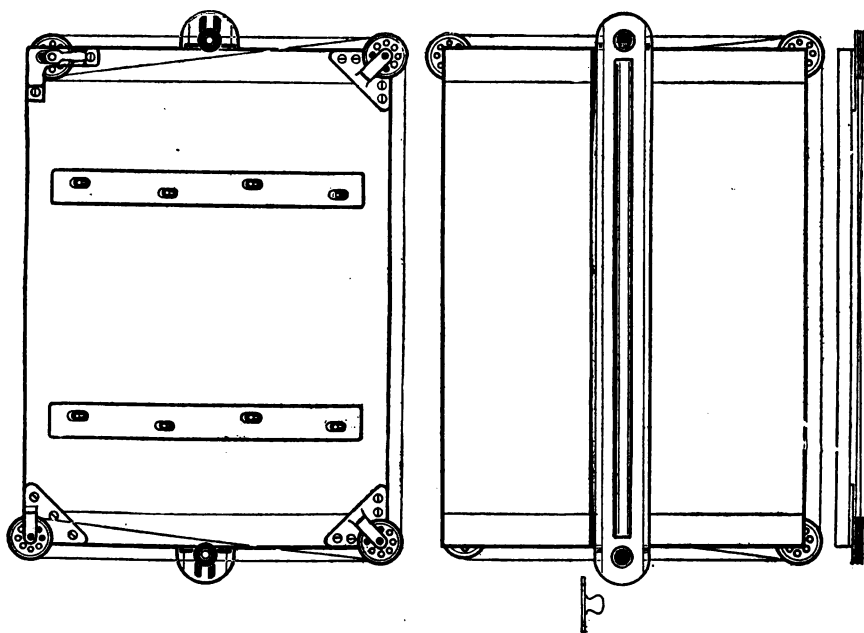
	Per Pair
6211 Wooden Horses, without slanting tops, 36½ in. high; 35 in. long	\$3.00
6213 Wooden Horses, with slanting tops, 36½ in. high; 35 in. long..	3.50
6215 Wooden Horses, extra heavy, without slanting tops, 36½ in. high; 35 in. long.....	5.00
6217 Same as 6215, but with slanting tops	5.50
6219 Adjustable Wooden Horses, best quality, 38 in. high; 35 in. long	7.00

Stools for Draughtsmen



	24 in.	30 in.	36 in. high
6221 Hardwood Stool, wood seat.....each,	\$1.25....	\$1.50....	\$1.75
6222 Hardwood Stool, cane seat.....each,	1.75....	2.00....	2.25
6223 Hardwood Stool, wood seat, screw top, can be raised from 30 to 34 inches.....each,			4.25
6224 Hardwood Stool, cane seat, screw top, can be raised from 30 to 34 inches.....each,			4.75

Automatic T Square



Automatic T Square Attached to Drawing Board. Front and Rear View.

Automatic T Square, consists of a straight edge attached to the board by means of wires and pulleys, which enable the draughtsman to move the straight edge up and down the board with a perfectly parallel and free and easy motion. It is easily attached in the manner shown in above illustration.

6226 Ashwood, Maple Lined Straight Edge, with ledge for pencils and drawing tools, complete with wheels and wires, ready to attach.
 For boards, 30 42 48 60 72 84 96 108 120 in. long
 Each\$4.75 5.35 6.05 6.75 7.45 8.65 9.60 10.30 12.00

6228 Maple, Celluloid Lined Straight Edge, with ledge for pencils and drawing tools, complete with wheels and wires, ready to attach.
 For boards 30 42 48 60 72 84 96 in long
 Each\$5.95 7.20 8.30 10.75 12.20 14.90 19.10

6232 Set of wheels and wires, without Straight Edge.....each, \$3.50



Adjustable Drawing Tables



	Each
23 x 31 in....	\$ 8.00
31 x 42 in....	10.00
36 x 48 in....	14.25

6236 The Comfort Adjustable Drawing Stand is provided with a slide for raising or lowering the board, and has an iron arc attached, by which the board can be set at any inclination desired for a standing or sitting position; it can be folded up when not in use.



	Each
23 x 31 in..	\$ 7.50
31 x 42 in..	9.50
36 x 48 in..	13.75
42 x 60 in..	18.00

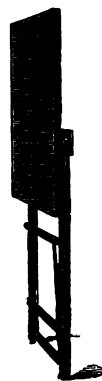
6241 The Normal Adjustable Drawing Table can be raised, lowered, or set at an inclination instantly, by simply loosening the nut of the central rod, which moves in slots of the legs, as readily seen from the illustration. The Drawing Board can be detached and the trestles folded up, occupying but little more space than an ordinary drawing board.

Adjustable Drawing Tables—Continued



- 6261 Forsyth Adjustable Drawing Table.** A Self Adjusting Table consisting of a Hardwood Trestle and a Pine Drawing Board. Table can be raised or lowered at will, and in addition to this the Drawing Board can be tilted to any desired angle. The adjustment for either is absolutely automatic and it is not necessary to fasten any screws or bolts for either adjustment. With drawer 17 x 15 x 3 inches.

	30 x 38	32 x 42	36 x 50	36 x 54
Each	\$15.65	\$16.35	\$18.20	\$19.25



- 6262 Folding Drawing Table,** is well braced and substantially made. Can be folded and moved without inconvenience.

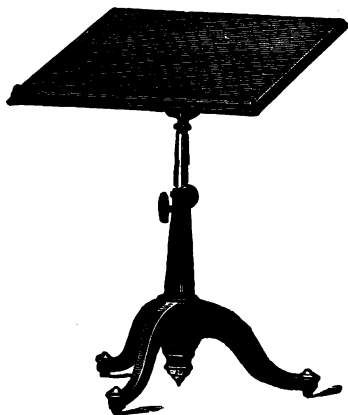
All tables have hardwood base and softwood top.

Special sizes made to order.

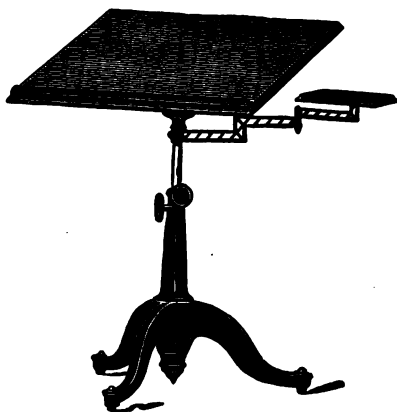
With Board, 24 x 32 in.	30 in. high.....	each, \$4.50
With Board, 32 x 42 in.	38 in. high.....	each, 6.00
With Board, 37 x 48 in.	38 in. high.....	each, 8.00



Academy Drawing Tables



6263

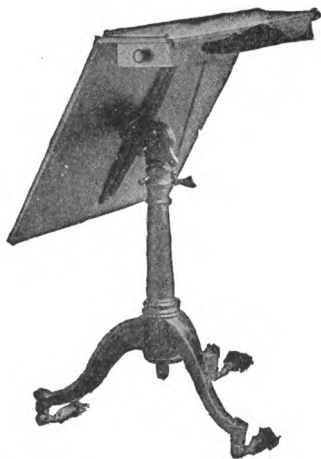


6265

- 6263 Ash Top, 23x26 in.....each, \$6.50
 6265 Same as 6263, with folding arm and plain shelf..... " 7.00
 6267 Same as 6263, with drawer, shelf and folding arm..... " 8.00

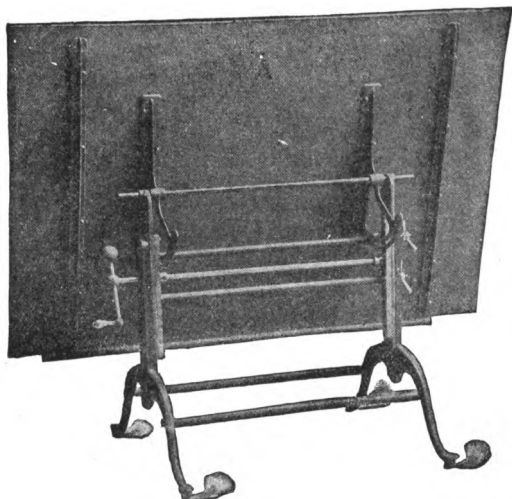
Academy Drawing Tables, with Revolving Top

- 6270 Ash Top, 23x26 in., on castors.....each, \$7.50
 6271 Same as 6270, with folding arm and plain shelf, on castors.. " 8.00
 6272 Same as 6270, with drawer, shelf and folding arm..... " 9.00



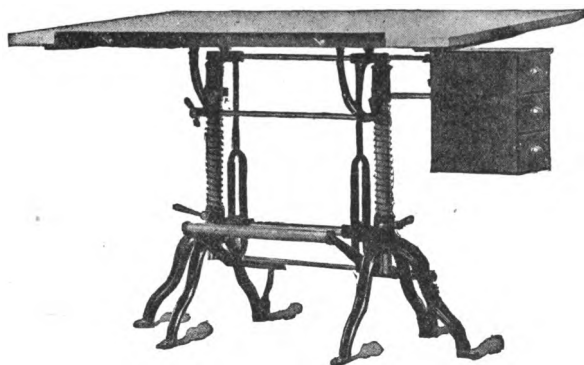
- 6275 Iron Stand Table, with oak or pine top, 24x26 in. Can be tilted to any angle. Can be raised or lowered and then clamped at any desired height. Can also be revolved in all directions. With shelf and 2 drawer cabinet (see cut)....each, \$13.50
 6276 Iron Stand Table, same as No. 6275, with rack and pinion for vertical adjustment " 17.00
 6278 Swinging Arm with drawer, 7½x13x3½ in. and tray top, for tables, Nos. 6275 and 6276..... " 3.50

Adjustable Drawing Tables



31 x 42 in.....each,	\$25.00
37 x 48 in.....each,	29.50
37 x 60 in.....each,	32.50
37 x 72 in.....each,	37.00
43 x 60 in.....each,	36.50
43 x 72 in.....each,	39.00
48 x 72 in.....each,	43.00

6285 Iron Stand Drawing Table, of rigid construction, very easily adjusted, can be tilted to any angle, and can be adjusted in height from 30 to 42 inches. The vertical adjustment is accomplished by a rack and pinion movement, operated by a crank as shown in illustration. The table tops are made of well seasoned white pine.



31 x 42 in...each,	\$33.50
37 x 48 in...each,	38.50
37 x 60 in...each,	42.50
37 x 72 in...each,	46.00
43 x 60 in...each,	45.50
43 x 72 in...each,	48.00
48 x 72 in...each,	52.00

Extras for 6285 & 6287
 Drawer $7\frac{1}{2} \times 13 \times 3\frac{1}{2}$,
 with tray top and
 swinging arm.ea., \$3.50
 2 Drawer Cabinet,
 $7\frac{1}{2} \times 13 \times 3\frac{1}{2}$...ea., \$4.00
 3 Drawer Cabinet,
 $7\frac{1}{2} \times 13 \times 3\frac{1}{2}$...ea., \$6.00

6287 Iron Stand Drawing Table, with drawing board top made of well seasoned white pine. Can be tilted to any angle and can be raised or lowered by means of a rack and pinion operated by a foot lever, which also serves as a foot-rest. This table has the tube and spring construction, which prevents the table from dropping when the clamps are released, and also assists the operator to raise the table top. All iron work baked enamel. Table can be raised from 30 to 45 inches in height.

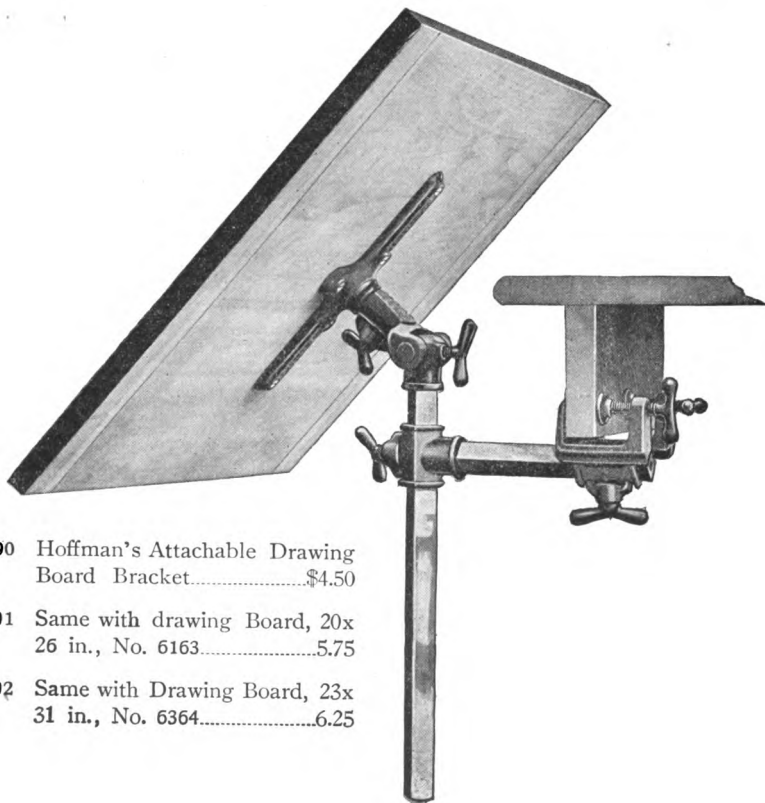
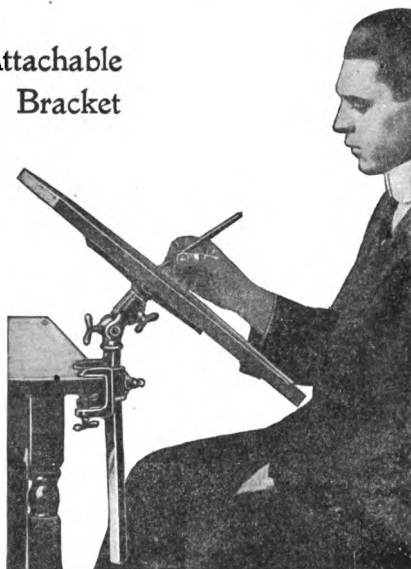


The Hoffman Attachable Drawing Board Bracket

A neat practical and most convenient article for the use of artists and draftsmen.

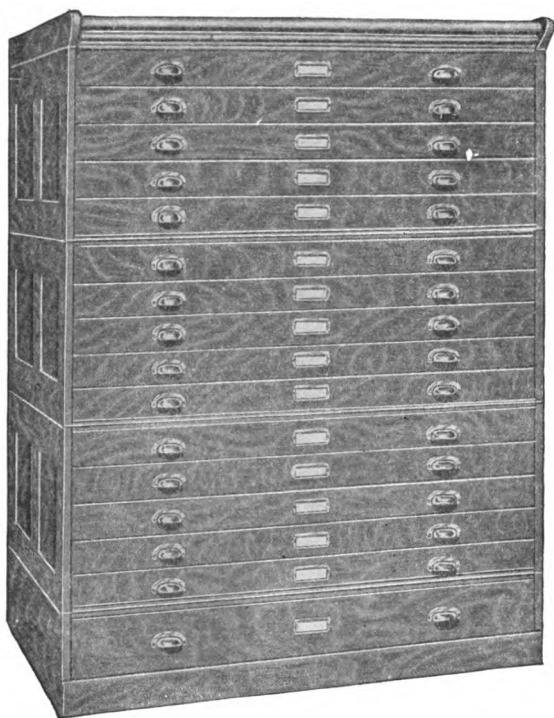
Can be attached to table, desk or chair in various ways and adjusted to any desired height, and tilted and locked at any angle. The top can be reversed.

Its weight is $6\frac{1}{2}$ lbs. and will support a drawing board 3 feet square. Substantially constructed and guaranteed to give satisfaction.



- 6290 Hoffman's Attachable Drawing Board Bracket.....\$4.50
- 6291 Same with drawing Board, 20x 26 in., No. 6163.....5.75
- 6292 Same with Drawing Board, 23x 31 in., No. 6364.....6.25

Sectional Filing Cases For Drawings, Tracings, Blue Prints, Specifications, Maps, Photographs, Etc.



These Sectional Cabinets are made in various interchangeable sections as hereinafter described. Constructed of first-class materials and occupy a minimum space. Quality and uniformity in size guaranteed.

Made of Oak. Paneled sides and strong back. Drawers have dove-tailed corners, are hung at the sides to reduce space and have 6 inch covers at the back to prevent drawings from curling over. Maple drawer sides and slides.

Oak Cabinets finished in golden oak color, with drawer pulls and label holders of antique copper are carried in stock.

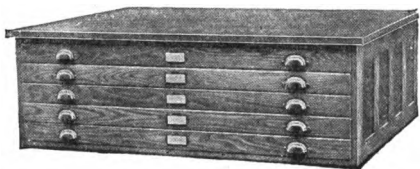
Other finish or trimmings furnished to order.

Made in two sizes:

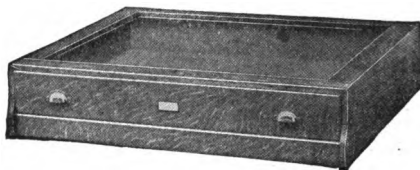
Double Elephant, inside measure.....	32 x 42½ inches
Standard, inside measure.....	25 x 37½ inches



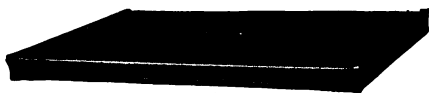
Sectional Filing Cases—Continued



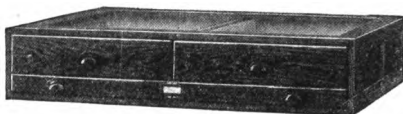
6300-6315 A



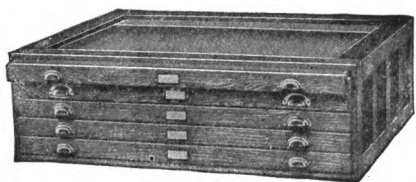
6300-6315 F



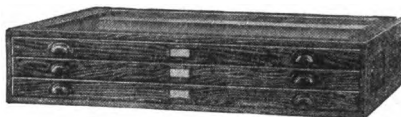
6300-6315 B



6300-6315 K



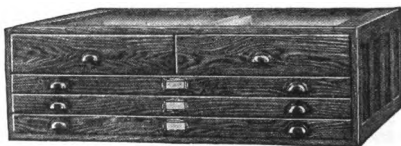
6300-6315 C



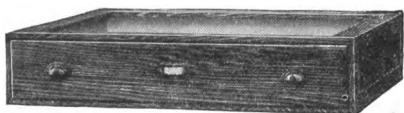
6300-6315 L



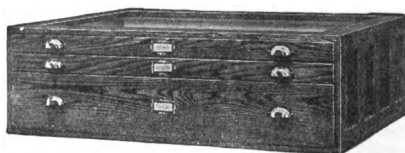
6300-6315 D



6300-6315 M



6300-6315 E

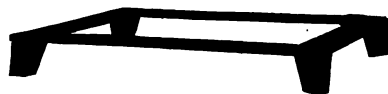


6300-6315 O

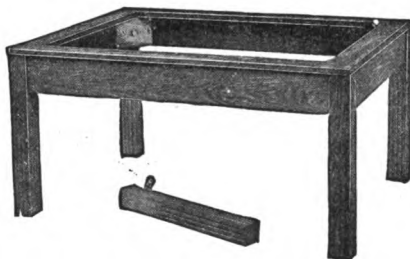
Sectional Filing Cases—Continued



6300-6315 G



6300-6315 H



6300-6315 J

		Inside Length Inches	Width of Drawers Inches	Depth of Drawers Inches	Outside Length Inches	Width Over All Inches	Height Over All Inches	Shipping Weight Pounds	EACH
6300—A	Five Drawer Section								
	with oak top attached	42½	32	2	47	35	15¾	160	\$26.50
B	Oak Cap .....	...	...	...	45½	35½	3	75	7.50
C	Five Drawer Section..	42½	32	2	45½	34½	14½	150	22.50
D	Three Drawer Section..	42½	32	3¾	45½	34½	14½	145	21.50
E	One Drawer Section...	42½	32	6	45½	34½	8	90	11.50
F	Base with Drawer....	42½	32	6¼	45½	34½	9½	95	11.00
G	Plain Base .....	...	...	...	45½	34½	4	35	5.00
H	Low Sanitary Base....	...	...	...	45½	34½	5¾	30	5.00
I	High Sanitary Base....	...	...	...	45½	34½	22¾	70	9.75
K	Two Drawers 20x32x 3¼ and One Drawer 32x42½x2	42½	32	2	45½	34½	9¼	100	18.00
L	Three Drawers	42½	32	2	45½	34½	9¼	100	17.00
M	Two Drawers 20x32x 3¼ and Three Draw- ers 32x42½x2 .....	...	...	...	45½	34½	14½	155	23.50
O	Two Drawers 32x42x 2 and One Drawer 32x42½x7 .....	...	...	...	45½	34½	14½	140	20.00
6315—A	Five Drawer Section								
	with oak top attached	37½	25	2	42	27¾	15¾	135	24.00
B	Oak Cap .....	...	...	...	40½	28	3	65	6.75
C	Five Drawer Section..	37½	25	2	40½	27¼	14½	125	20.25
D	Three Drawer Section..	37½	25	3¾	40½	27¼	14½	115	19.25
E	One Drawer Section....	37½	25	6	40½	27¼	8	85	10.25
F	Base with Drawer....	37½	25	6¼	40½	27¼	9½	85	9.75
G	Plain Base .....	...	...	...	40½	27¼	4	25	4.75
H	Low Sanitary Base....	...	...	...	40½	27¼	5¾	25	4.75
I	High Sanitary Base....	...	...	...	40½	27¼	22¾	60	8.00
K	Two Drawers 17½x25 x3¼ and One Draw- er 37½x25x2	37½	25	2	40½	27¼	9¼	90	16.50
L	Three Drawers	37½	25	2	40½	27¼	9¼	90	15.75
M	Two Drawers 17½x25 x3¼ and Three Draw- ers 37½x25x2 .....	...	...	...	40½	27¼	14½	130	18.75
O	Two Drawers 37½x25 x3¼ and One Draw- er 37½x25x7 .....	...	...	...	40½	27¼	14½	115	18.00

Tool tray for Sections K and M, each, \$1.00



Combination Drawing Tables and Filing Cabinets

These cuts illustrate some of the practical combinations of our Sectional Filing Cases. Other combinations can be made by substituting any sections illustrated on previous pages.



6316

This cabinet is composed of two No. 6300 C, one No. 6300 H, a sketch box three inches deep with a drawing board top and a tilting adjustment, also a swing drawer with tray. The top projects over the front from six to eight inches. Can be raised and lowered ten inches on the level, and can be tilted to almost any desired angle. The tilting device is so arranged that it makes a very rigid outfit.

6316 A, with top 37 x 54 in.....	\$73.00
6316 B, with top 37 x 60 in.....	74.00
6316 C, with top 40 x 72 in.....	78.50



6317

This cabinet is composed of one No. 6300 C, one No. 6300 J, a swing drawer with tray, and a drawing board top put on with slides so it can be drawn forward. This combination gives five drawers for filing purposes and is a very neat and durable outfit.

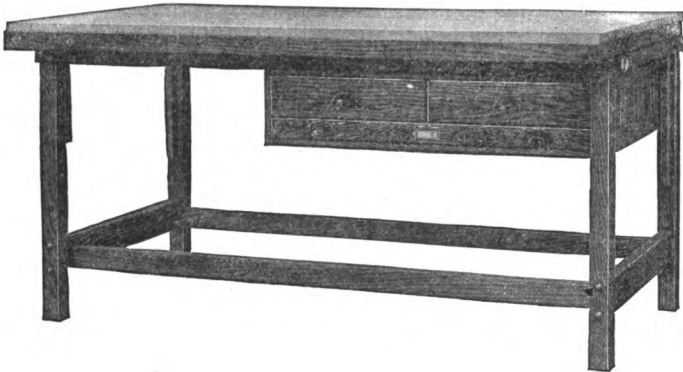
6317 A, with top 37 x 54 in.....	\$49.00
6317 B, with top 37 x 60 in.....	50.00
6317 C, with top 40 x 72 in.....	54.50

Combination Drawing Tables and Filing Cabinets—Continued

The Filing Cabinets can also be used in combination with an adjustable Drawing Table Frame as illustrated.



6718—This cabinet is composed of one section 6300 C, one 6300 K, Adjustable Drawing Table Frame and a Drawing Board, 42 x 72.....\$68.50



6319—This cabinet is composed of one section 6300 K, Adjustable Drawing Table Frame and a Drawing Board, 42 x 72.....46.00

6320—Adjustable Drawing Table Frame separately.....\$15.00

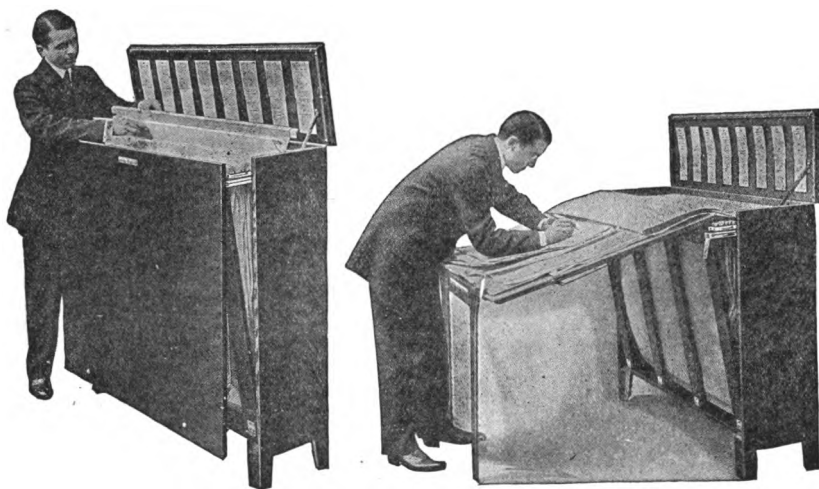
Prices on other combinations quoted on application

For prices of Drawing Boards to fit these frames see page 131

Prices of Cabinets on page 139-141



Vertical Filing Cabinets



6329½ Vertical Filing Cabinet:

A neat, compact and dust proof form of filing drawings, tracings, blue prints, etc., vertically. Recommended for offices where floor space is limited. Capacity, 700-1000 prints indexed for instant reference, on inside of cover (see illustration). Each cabinet contains 20 strong manilla pockets, numbered 1-20, re-enforced at the folds with heavy linen. These pockets are closed half way up and are suspended on lateral supports by means of hardwood strips. When cabinet is open, they hang loosely so that they can be easily lifted out for the purpose of removing or inserting drawings. In this open position, the front is rigidly supported by two legs, making a handy table for reference purposes. (See cuts).

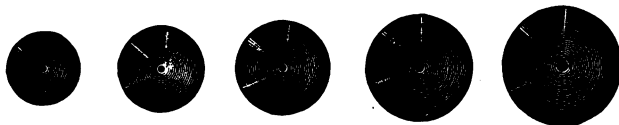
Outside Dimensions			For Filing	Plain Oak	Quartered	Finish
High	Wide	Deep	Plans	Finish	Oak	in
			up to		Gold. Fin.	Mahogany
46¾	45½	14½	36x40 in.....	\$51.00	\$61.00	\$71.50
40¾	49¾	14½	30x44 in.....	51.00	61.00	71.50

Extra pockets, either sizeeach, \$1.25

Thumb Tacks.

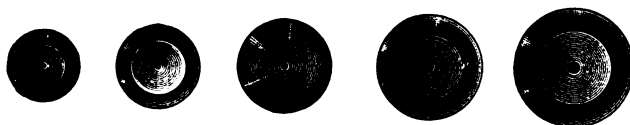
Best quality German silver, with extra hardened screwed-in steel pins.

$\frac{3}{8}$ in. $\frac{1}{2}$ in. $\frac{1}{2}$ in. $\frac{1}{2}$ in. $\frac{5}{8}$ in.



Round Heads,	6330	6332	6334	6336	6338
Per doz., on cork, \$	.35	.40	.50	.60	.70
Per gross, "	3.50	4.00	5.00	6.00	7.00

6339 Best quality Thumb Tacks, German silver, $\frac{1}{4}$ in. diameter, with extra long points, $\frac{1}{2}$ in. long, for fastening mounting boards, photos and other heavy boards.....per doz., \$.60 per gross, \$6.00



Beveled Heads,	6340	6342	6344	6346	6348
Per doz., on cork, \$	.40	.50	.60	.70	.80
Per gross, "	4.00	5.00	6.00	7.00	8.00



Riveted Thumb Tacks.

These tacks are constructed so that the points cannot come through the head, as sectional view will plainly show.

Pat. 1892.	$\frac{3}{8}$ in.	$\frac{1}{2}$ in.	$\frac{5}{8}$ in.
German Silver,	6350	6352	6354
Per doz.....	\$.15	.20	.25
Per gross.....	1.50	1.65	1.85
Brass,	6360	6362	6364
Per doz.....	.10	.12	.15
Per gross.....	1.00	1.15	1.25

"Record" Thumb Tacks.

IMPROVED CONSTRUCTION, which entirely overcomes the drawbacks customary to other tacks, i. e. the bending or breaking of the pins, or their penetrating the head of the tack; they supersede other low-priced tacks by superiority of material, uniformity of sizes and finish. Their heads are shaped so as to offer as little obstruction as possible to the free gliding of the T square-blade.



Diameter $1\frac{5}{8}$ in.
6370



$\frac{3}{8}$ in.
6372
Per box of 100.....\$.25
Per doz. boxes.....2.50



$\frac{1}{2}$ in.
6374
Per box of 100......35
Per doz. boxes.....3.50



Stamped Steel Tacks and Horn Centers



5/16 in.
6380



3/8 in.
6382



1/2 in.
6384



6388



6389



- 6380** Stamped Steel Tacks, 5/16 in., 100 in box with tack lifter,
per doz. boxes, \$4.00..per box, \$.40..per doz., \$.08
- 6382** Stamped Steel Tacks, 3/8 in., 100 in box with tack lifter,
per doz. boxes, \$5.00..per box, \$.50..per doz., \$.10
- 6384** Stamped Steel Tacks, 1/2 in., 100 in box with tack lifter,
per doz. boxes, \$6.50..per box, \$.65..per doz., \$.12
- 6388** Horn Center, plain, 1/2 in.....each, \$.10
- 6389** Horn Center, with German silver rim, 3/4 in..... " .50

Higgins' Inks



6395



6396



6397

- 6395 Higgins' American Drawing Inks:**
Black Waterproof, General (not waterproof), Carmine, Blue, Green,
Yellow, Brown, Brick Red, Scarlet, Vermilion, Indigo, Orange,
Violet, White.
Any of above colors.....per doz. bot., \$2.81.....per bot., \$.25
1/2 Pint, \$2.00.....Pint, \$3.75.....Quart, 7.00
- 6396 Higgins' Engrossing Ink**, a dense black indestructible ink, specially
adapted for all important writings, records, engrossings, and for fancy
penmanship, card writing, etc. Waterproof when dry:
2 oz. bottles.....per bot., \$.20.....per doz. bot., \$2.40
1/2 Pint, \$.60.....Pint, 1.00.....Quart, 1.75
- 6397 Higgins' Eternal Ink**, a fine, fluent carbon writing ink for general
use:
2 oz. bottles.....per bot., \$.10.....per doz. bot., \$1.20
1/2 Pint, \$.35.....Pint, .60.....Quart, 1.00

Kolesch & Co. Drawing Ink



6405 Kolesch & Co. Liquid Waterproof Drawing Inks. All colors are waterproof and very opaque; suitable for blue printing. Flow freely and will not dry in the pen. The **black** we mention especially, as lines drawn with this ink are absolutely **black** and opaque. Put up in round bottles containing $\frac{3}{4}$ ounce, with cork stopper and quill filler.

Black,	per dozen bottles,	\$2.25	Per bottle	.....,	\$ .20
Carmine,	" " "	2.25	" "	.....	.20
Blue,	" " "	2.25	" "	.....	.20
Green,	" " "	2.25	" "	.....	.20
Yellow,	" " "	2.25	" "	.....	.20
Brown,	" " "	2.25	" "	.....	.20

6401 Kolesch & Co. Drawing Ink, in $\frac{1}{2}$ Pint bottles:

$\frac{1}{2}$ Pint bottles of any of above colors.....each, \$1.75

6402 "Nassau" Drawing Ink, in Pint bottles:

Pint bottles of any of above colors..... " 3.00

6403 "Nassau" Drawing Ink, in Quart bottles:

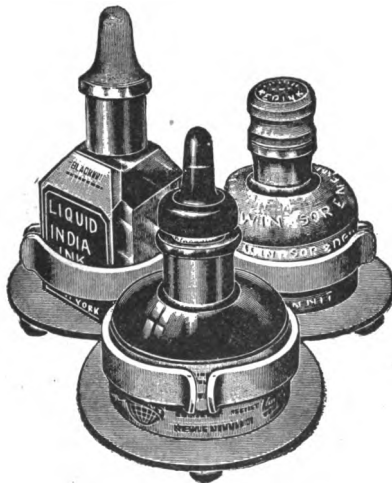
Quart bottle of any of above colors..... " 5.50

Liquid Drawing Inks

- 6404** **Bourgeois French Liquid Black Drawing Ink.** Not waterproof:
 Large sizeper doz., \$4.50.....per bot., \$.50
 Small sizeper doz., 2.25.....per bot., .25
- 6407** **Gunther Wagner's "Chin-Chin" Liquid Black Waterproof Drawing Ink:**
 $\frac{3}{4}$ oz. bottle.....per doz., \$3.00.....per bot., \$.25
 $\frac{1}{2}$ Pint, \$2.00.....Pint, \$4.00.....Quart, 7.50
- 6408** **Gunther Wagner's "Pelican" Liquid Colored Waterproof Drawing Inks:**
 Carmine, Scarlet, Vermilion, Brick Red, Ultramarine, Neutral Tint, Cobalt Blue, Prussian Blue, Light Green, Dark Green, Yellow, Orange, Brown, Raw Sienna, Burnt Sienna, Indigo, Violet:
 $\frac{3}{4}$ oz. bottle.....per doz., \$3.00.....per bot., \$.25
 $\frac{1}{2}$ Pint, \$2.00.....Pint, \$4.00.....Quart, 7.50
- 6409** **Collins' Liquid Waterproof Drawing Inks:**
 Black Waterproof, Black, non-Waterproof, Scarlet, Vermilion, Brown, Carmine, Brick Red, Orange, Green, Blue, Indigo, Violet, Yellow:
 1 oz. bottle.....per doz., \$3.00.....per bot., \$.25
 $\frac{1}{2}$ Pint, \$1.75.....Pint, \$3.00.....Quart, 5.00

Clover Inkstand

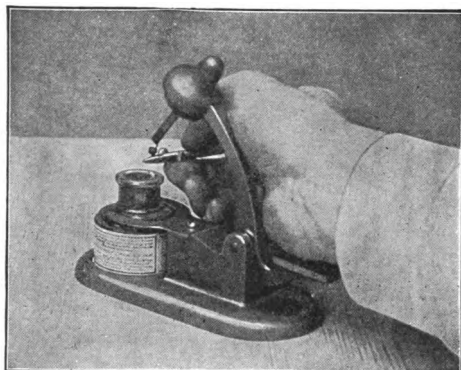
Patent Applied For.



Holds Any Drawing Ink Bottle.

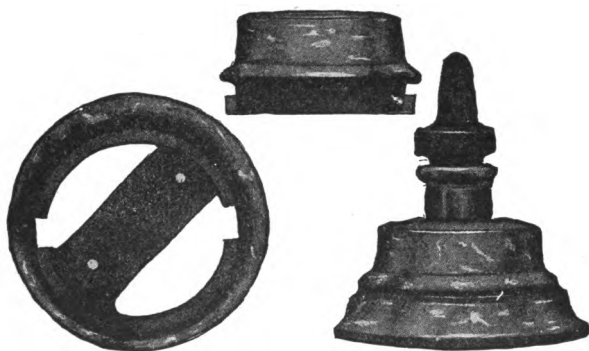
- 6410** **The Clover Inkstand** is a boon to users of drawing inks, who desire a bottle holder that is almost impossible to upset or in any way dislodge the bottles held therein. This bottle holder adjusts itself to hold the various shapes and sizes of bottles in which different manufacturers put up their inks. Can be used with one, two or three bottles of any size, as each bottle is held independently of the others, and any of the bottles may be instantly removed by simply opening the clasping spring.....per doz., \$3.50....each, \$.35

Alteneder's Pen-Filling Inkstand



- 6411** Alteneder's Pen-Filling Inkstand. This enables the draftsman to fill the ruling pen with one hand while holding triangles, etc, with the othereach, \$1.50

One Bottle Inkstand



- 6412** Iron Inkstand and Paper Weight, to hold one bottle of ink. each, \$.25
6413 Wooden Inkstand to hold 5 bottles of Higgin's Ink..... " .50

India Ink in Sticks



6414-6415



6416-6417

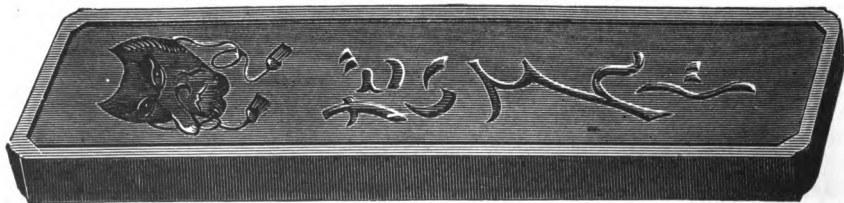


6418



6421

6414	Lion Head, small.....	each, \$	.15
6415	Lion Head, medium.....	"	.25
6416	Super-Super, small	"	.50
6417	Super-Super, large	"	1.00
6418	Stork Ink	"	2.50
6419	Pearl Ink.....	"	2.50
6421	Double Dragon	"	4.00
6423	3 Kings and Moon.....	"	5.00



6424 Japan Ink, waterproof.....each, \$1.00

Liquid White, Process Inks, etc.



- 6428 Sample's White, Liquid:
per bottle, \$.30....per dozen bottles, \$3.00....per ½ lb. jar, \$1.40
- 6429 Bonny's White, Liquid:
per bottle, \$.30....per dozen bottles, \$3.00....per ½ lb. jar, \$1.40
- 6430 Bonny's White, Liquid:
per tube, \$.35....per dozen tubes, \$3.50
- 6431 W&N Permanent Chinese White, per jar, \$.32...per doz. jars, \$3.75
as above, large jars, per jar, .63...per doz. jars, 7.50
as above, extra large jars, per jar, 1.50...per doz. jars, 15.00
- 6434 W&N Permanent Chinese White in small tubes,
per tube, \$.25...per doz. tubes, \$2.50
as above, in large tubes, per tube, .50...per doz. tubes, 5.00
as above, extra large tubes, per tube, 1.00...per doz. tubes, 10.00
- 6439 W&N Albanine (Process White)
per bot., \$.32...per doz. bot., \$3.75
- 6441 W&N Process Black, per bot., 32...per doz. bot., 3.75
- 6443 W&N Liquid Ox Gall, per bot., 32...per doz. bot., 3.75
- 6444 W&N Liquid Vermilion (Opaque)
per bot., .32...per doz. bot., 3.75
- 6447 Soehne Freres' Retouching Varnish for water colors
per bot., .25...per doz. bot., 3.00
- 6448 Pure Gold Tablets in Cups each, 1.75
- 6449 Pure Silver Tablets in Cups each, .30
- 6450 Valerio White in Double Tubes
per tube, \$.30...per doz. tubes, 3.00
- 6451 Lumino White, Extra Large Tubes
per tube, .30...per doz. tubes, 3.00



Prepared White and Bronze Water Colors



Double Size Tubes.

- | | | | |
|------|---|------------------|--|
| 6452 | Bourgeois Blanc D'argent (Flake White), in tubes | per doz., \$3.60 | per tube, \$.30 |
| 6453 | Bourgeois Blanc D'argent in bottles.. " " | 3.00 | " " .25 |
| 6454 | Bourgeois Shell White. Dry Flakes soluble in water. Preferred by many artists to the prepared white.... | per lb., \$3.00 | per oz., \$.25 |
| 6458 | Velvet White (Wadworth's) in double tubes, | per doz., \$3.00 | each, .30 |
| 6459 | Holmes' White, in bottles, | per doz., \$3.00 | per bot., \$.30 ½ lb., jar, \$1.40 |
| 6465 | Schmincke's White, in quadruple tubes..... | per tube, \$.60 | |
| 6466 | Thomson's White, in double tubes, white label..... | " " | .30 |
| | Blue label | " " | .35 |

Bronze Water Colors



- 6467** Bronze Water Colors, applied with a brush dipped in water. Useful for bronzing any article such as frames, plaster casts, wood carvings, wicker ware, metal objects, etc. Soluble in water, ready for use: Pale Gold, Rich Pale Gold, Deep Gold, Rich Gold, Silver, Copper, Crimson, Orange, Lemon, Fire Red, Emerald Green, Rose, Carmine, Violet, Marine Blue, Sapphire Blue. In china pans, per box of 10 colors of one kind or assorted.....\$2.00
Per single pan20

Winchester "Aerograph" Colors for Air Brush Work

Made by Winsor & Newton.

Not intended to be used with water color brushes.

6468 Aerograph Colors, for Air Brush Work, Grade I.....each, \$.50



Alizarin Green	Naples Yellow
Blanc D'argent, No. 2	Neutral Tint
Burnt Sienna	Permanent Crimson
Burnt Umber	Permanent Scarlet
Charcoal Grey	Prussian Blue
Chinese White	Raw Sienna
Chrome Lemon	Raw Umber
Chrome Yellow	Ultramarine, Light
Chrome Deep	Ultramarine, Middle
Chrome Orange	Ultramarine, Deep
Cologne Earth	Vandyke Brown
Emerald Green	Vermilion
Indian Red	Yellow Ochre
Lamp Black	
Light Red	
Mauve (Blue Shade)	
Mauve (Purple Shade)	

6468 Aerograph Colors, for Air Brush Work, Grade II.....each, \$.75
Brown Madder, Emerald Oxide of Chromium, Indian Yellow, Sepia.

Talens' Photographic Glossy Colors in Tubes

6468½ Talen's Photographic Glossy Colors,
Grade Iper doz., \$3.00 per tube, \$.25

Retouch No. 1, Reddish	Albumen White, No. 2
Retouch No. 2, Brownish	Albumen White, No. 3
Retouch No. 3, Blackish	Burnt Sienna
Albumen White, No. 1	Sepia
	Yellow Ochre

6468¾ Talen's Photographic Glossy Colors,
Grade II, Carmine, Cobalt, Scarlet....per doz., \$7.50 per tube, \$.63

6469 Talen's Moist Color for Back-
ing Negativesper doz. tubes, 3.00 " .25

W. W. Moist Water Colors.

6469A W W Moist Water Colors, dry with a soft satin finish. For poster, show card, decorative and advertising purposes, etc.

SERIES A. Gloss Black.

SERIES B.

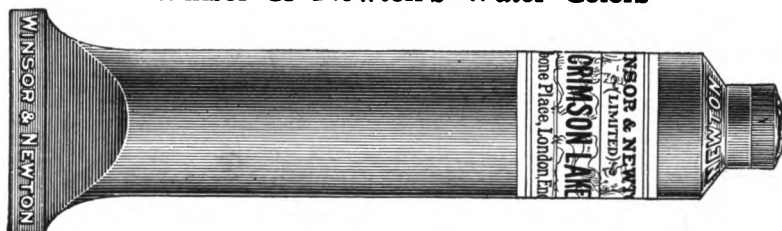
Chrome Yellow (5), Ultramarine Blue (11), Ivory Black (29), Chrome Green Dark (43), White (57), Brown (36), Cobalt Blue (12), Orange (4), Lavender (61), Chrome Green Light (63), Lamp Black (59), Lemon Yellow.

SERIES C. Light Red (25), Turquoise Blue (16), Dark Red (64).

	2 oz.	½ Pint	Pint	Quart
Series A	\$.10	\$.25	\$.40	\$.75
Series B .....	.15	.40	.75	1.40
Series C .....	.25	.65	1.25	2.35



Winsor & Newton's Water Colors



Studio Size.



Size of Whole Tubes.

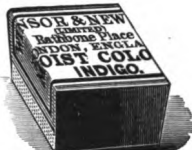


Size of Half Tubes.

Whole Pan.



Half Pan.



- (A) Made in cakes and $\frac{1}{2}$ cakes only.
 (B) Not made in cakes or $\frac{1}{2}$ cakes.
 (C) Made only in tubes, $\frac{1}{2}$ tube and studio size.
 (D) Made only in pans, $\frac{1}{2}$ pans, cakes and $\frac{1}{2}$ cakes.
 (E) Made only in pans and $\frac{1}{2}$ pans.

*Carried in stock in Studio size, other colors imported to order.

SERIES I.

6470	Whole pans, whole cakes or whole tubes..	per doz.,	\$3.00	each,	\$.25
	Half pans, half cakes or half tubes.....	"	1.65	"	.14
	Studio size	"	9.00	"	.75

*Antwerp Blue	(B) Cyprus Umber	Neutral Tint
Bistre	(C) Davy's Gray	*New Blue
Blue Black	Dragon's Blood	*Olive Green
(A) British Ink	*Emerald Green	*Payne's Gray
(A) Bronze	Flake White	Permanent Blue
Brown Ochre	*Gamboge	*Prussian Blue
Brown Pink	*Hooker's Green, I	Prussian Green
*Burnt Sienna	*Hooker's Green, II	*Raw Sienna
*Burnt Umber	*Indian Red	*Raw Umber
*Charcoal Gray	*Indigo	Roman Ochre
Chinese White	Italian Pink	*Sap Green
(B) Chinese Blue	*Ivory Black	Terre Verte
Chrome Lemon	King's Yellow	*Vandyke Brown
*Chrome Yellow	*Lamp Black	Venetian Red
*Chrome Deep	*Light Red	*Yellow Lake
*Chrome Orange	(B) Mauve	Yellow Ochre
Cologne Earth	*Naples Yellow	
(A) Constant White	(B) Do. Deep	



Winsor & Newton's Water Colors—Continued

SERIES II.

- 6471 Whole Pans, Whole Cakes or Whole Tubes. per doz., \$6.00 each, \$.50
 Half Pans, Half Cakes or Half Tubes.... " " 3.00 " .25
 Studio Size " " 18.00 " 1.50

Alizarin Carmine	(B) Madder Carmine	Ruben's Madder
*Alizarin Crimson	(Alizarin)	(B) Ruby Madder
(D) Alizarin Green	Mars Yellow	(Alizarin)
(D) Alizarin Orange	Neutral Orange	*Scarlet Lake
Alizarin Scarlet	(E) Orange Madder	(B) Scarlet Madder
Alizarin Yellow	(Alizarin)	(Alizarin)
(A) Black Lead	Orange Vermilion	Scarlet Vermilion
*Brown Madder	(B) Permanent Brown	*Sepia
Carmine Lake	(B) Permanent Crim-	Spectrum Red
*Crimson Lake	son	Spectrum Violet
Cyanine Blue	Purple Lake	Spectrum Yellow
*Indian Yellow	Roman Sepia	Vermilion
Leitch's Blue	(B) Rose Madder	Warm Sepia
	(Alizarin)	

SERIES III.

- 6472 Whole Pans, Whole Cakes or Whole Tubes. per doz., \$7.50 each, \$.63
 Half Pans, Half Cakes or Half Tubes.... " " 3.75 " .32
 Studio Size " " 22.80 " 1.90

(B) Cadmium Yellow, Extra Pale	(B) Emerald Oxide of Chromium	*Oxide of Chromium
*Cadmium Yellow, Pale	*French Blue	(B)*Oxide of Chromium Trans-
Cadmium Yellow, Middle	French Ultramarine	parent
Cadmium Yellow, Deep	Indian Purple	(E) Permanent Mauve
*Cadmium Orange	(D) Intense Blue	(D) Permanent Violet
Cerulean Blue	*Lemon Yellow	(B) Permanent Yellow
*Cobalt Blue	Mars Orange	(D) Pure Scarlet
Cobalt Green	(B) Mineral Gray	(B) Ultramarine Ash-
(B) Cobalt Violet	(B) Mineral Violet	Gray
	(B) Orient Yellow	Veronese Green
		*Viridian

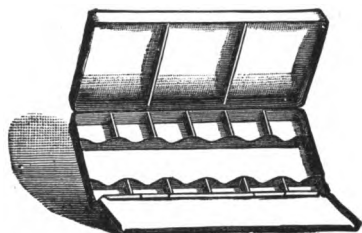
SERIES IV.

- 6473 Whole Pans, Whole Cakes or Whole Tubes. per doz., \$12.75 each, \$1.07
 Half Pans, Half Cakes or Half Tubes.... " " 6.38 " .54
 Studio Size " " 39.00 " 3.25

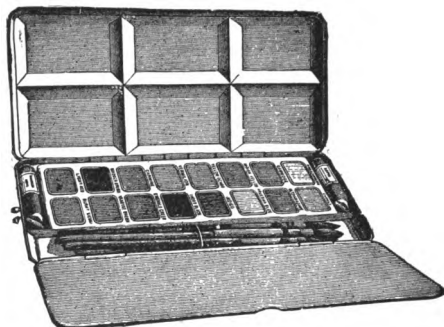
Aureolin	Gallstone	Rose Dore
Aurora Yellow	Madder Carmine	*Rose Madder
Burnt Carmine	Madder Lake	(B) Rose Madder
*Carmine	(B) New Olive Green	(Pink Shade)
(B) Cobalt Yellow	Pink Madder	Scarlet Madder
Field's Orange	Primrose Aureolin	Violet Carmine
Vermilion	Purple Madder	Yellow Carmine

SERIES V.

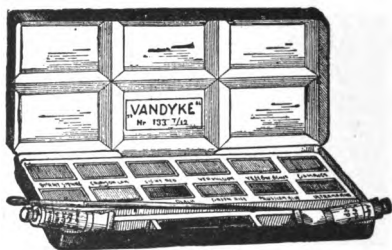
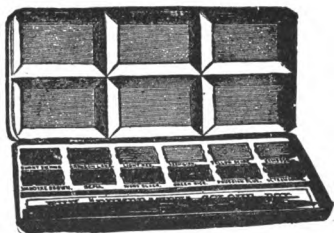
- 6474 Whole Pans, Whole Cakes or Whole Tubes. per doz., \$18.00 each, \$1.50
 Half Pans, Half Cakes or Half Tubes.... " " 9.00 " .75
 Smalt Ultramarine Ash Blue.

**6477 Empty Japanned Tin Box for Moist Water Colors:**

For Whole Pans.	For Half Pans	For Tubes.
6 Divisions, each, \$.80	6 Divisions, each, \$.70	12 Divisions, each, \$1.40
8 Divisions, " .90	8 Divisions, " .80	15 Divisions, " 1.50
12 Divisions, " 1.05	12 Divisions, " 1.00	20 Divisions, " 1.60
16 Divisions, " 1.20	16 Divisions, " 1.05	24 Divisions, " 1.75
20 Divisions, " 1.35	20 Divisions, " 1.25	30 Divisions, " 1.90
24 Divisions, " 1.50	24 Divisions, " 1.35	36 Divisions, " 2.10

Filled Japanned Tin Boxes

- 6478L** Murillo Color Box, large, 16 pans and 2 tubes, moist water color and brusheseach, \$.85
- 6478S** Murillo Color Box, small, 12 pans and 2 tubes, moist water color and brushes " .60



- 6479L** Rembrandt Color Box, large, 12 pans, moist water color and brusheseach, \$.40
- 6479S** Rembrandt Color Box, small, 6 pans, moist water color and brushes " .25
- 6479½** Van Dyke Color Box, 12 pans and 2 tubes, moist water color and brushes " .30

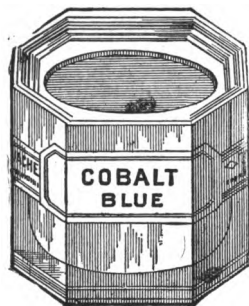
Bourgeois' French Moist Water Colors



Tube



Double Size Tubes



Pot

*Colors marked * made in small tubes only.

/Colors marked / made in glass pots and double tubes; not made in small tubes.

**Carried in stock in double tubes, other colors imported to order.

SERIES I.

6480 Tubes .each, \$.20 Double Tubes .each, \$.30 Glass Pots .each, \$.30

**Antwerp Blue (Bleu Mineral)

Bistre (Bistre)

/**Black Lake (Laque noire)

Blue Black (Noir de vigne)

Blue Verditer (Cendre Bleue)

Brown Ochre (Ocre brune)

**Brown Pink (Stil de grain brun)

Burnt Italien Ochre (Terre d'Italie
brulée)

**Burnt Sienna (Terre de Sienna brulée)

**Burnt Umber (Terre d'ombre brulée)

/Cashemire Yellow (Jaune cashemire)

Cassel Earth (Terre de Cassel)

*Charcoal Grey (Gris fusain)

Chinese White (Blanc de Chine ou
zinc)

**Chrome Green Light (Vert de

Chrome, No. 3)

Chrome Green Med. (Vert de chrome
No. 2)

**Chrome Green Deep (Vert de chrome,
No. 1)

Chrome Yellow Lemon (Jaune de
chrome citron)

**Chrome Yellow Light (Jaune de
chrome clair)

**Chrome Yellow Middle (Jaune d'or)

Chrome Yellow Deep (Jaune de
chrome foncé)

Cologne Earth (Terre de Cologne)

Dragon's Blood (Sang de Dragon)

Emerald Green (cendre verte)

**Flake White (Blanc D'argent)

**Gamboge (Gomme-gutte)

Green Lake (Laque verte)

**Hooker's Green (Vert végétal)

**Indian Red (Rouge indien)

**Indigo (Indigo)

Italien Ochre (Terre d'Italie
naturelle)

Italien Pink (Stil de grain jaune)

**Ivory Black (Noir d'ivoire)

**Lamp Black (Noire de bougie)

Lemon Yellow (jaune citron ou de
strontiane)

Light Red (Brun rouge)

Magenta Lake (Laque violette)

/Maize Yellow (Jaune mais)

**Moss Green (Vert mousse)

**Naples Yellow (Jaune de Naples)

/Naples Yellow Greenish (Jaune de
Naples vert)

**Neutral Tint (Teinte neutre)



Bourgeois French Moist Water Colors—Series I.—Continued

- | | |
|--|----------------------------------|
| Olive Green (Vert olive) | Red Lead (Rouge de Saturne) |
| **Payne's Grey (Gris de Payne) | Roman Ochre (Ocre d'or) |
| Paris Blue (Bleu de Paris) | Ru Ochre (Ochre de ru) |
| **Peach Black (Noir de peche) | **Sap Green (Vert de vessie) |
| Permanent White (Blanc fixe) | **Sky Blue (Bleu céleste) |
| **Prussian Blue (Bleu de Prusse) | Superfine Black (Noir extrafin) |
| Prussian Green (Vert de Prusse) | **Vandyke Brown (Brun Van Dyck) |
| **Raw Sienna (Terre de Sienna naturelle) | **Venetian Red (Rouge de Venise) |
| **Raw Umber (Terre d'ombre naturelle) | Veronese Green (Vert Veronese) |
| Red Chalk (Ocre rouge) | **Yellow Lake (Laque jaune) |
| | **Yellow Ochre (Ocre jaune) |

SERIES II.

- 6481 Tubes .each, \$.30 Double Tubes .each, \$.50 Glass Pots .each, \$.50**
- | | |
|---|---|
| Black Lead (Graphite) | **Purple, Deep (Pourpe foncée) |
| Brilliant Yellow (Jaune brillant) | *Scheele's Green (Vert de Scheele) |
| /Brown Lake (Laque mordérée) | **Sepia (Sepia naturelle) |
| Burnt Crimson Lake (Laque brûlée) | Transparent Green Blue (Vert lumière bleu) |
| **Crimson Lake, Light (Laque carminée rose) | **Transparent Green, Light (Vert lumière No. 2) |
| *Crimson Lake Deep (Laque carminée foncée) | **Transparent Green, Deep (Vert lumière No. 1) |
| Crimson Lake Extra (Laque rose extra) | **Ultramarine Blue, Light (Outremer clair) |
| Garnet Lake (Laque grenat) | **Ultramarine Blue, Deep (Outremer foncée) |
| Indian Lake (Laque indienne ou Dah-lia) | **Vermilion, Light (Vermillon clair) |
| *Mineral Green (Vert minéral) | **Vermilion, Deep (Vermillon foncé) |
| /Orient Blue (Bleu d'Orient) | **Violet, Light (Violette clair) |
| **Orient Red (Rouge turc) | **Violet, Deep (Violette foncé) |
| Persian Lake (Laque de Perse) | Warm Sepia (Sepia colorée) |
| **Purple, Light (Pourpe clair) | |

SERIES III.

- 6482 Tubes .each, \$.40 Double Tubes .each, \$.75 Glass Pots .each, \$.75**
- | | |
|--|--|
| Brown Madder (Brun Madder) | /Malmaison Rose (Rose Malmaison) |
| *Capucine Lake (Laque capucine) | Marine Blue (Bleu marine) |
| *Capucine Madder (laque de garance jaune capucine) | Mars Brown (Brun de Mars) |
| **Carmine II quality (Carmin fin) | Mars Orange (Orange de Mars) |
| **Carthamus Rose, Light (Rose carthame clair) | Mars Red (Rouge de Mars) |
| Carthamus Rose, Deep (Rose catharme foncé) | Mars Violet (Violet de Mars) |
| *Cherry Madder (Laque de garance cerise) | Mars Yellow (Jaune de Mars) |
| **Chinese Orange (Grenadine ou jaune du Japon) | Pink Madder (Laque de garance foncé) |
| Coeruleum (Coeruleum) | Ponceau Lake (Laque Ponceau) |
| **Cyprus Green, Light (Vert de Chypre No. 2) | *Purple Madder (laque de garance pourpre) |
| **Cyprus Green, Deep (Vert de Chypre No. 1) | Rose Madder (Laque de garance rose) |
| English Lake (Laque Anglaise) | *Rose Madder, Yellowish (Laque de garance rose doré) |
| Emeraude Green (Vert emeraude) | **Scarlet Lake (Laque écarlate) |
| **Geranium (Geranium) | Sevres Blue (Bleu de Sevres) |
| | **Transparent Blue (Bleu lumière) |
| | **Turquoise Blue (Bleu paon) |
| | **Tyrian Rose (Rose tyrien) |

Bourgeois' French Moist Water Colors—Continued

SERIES IV.

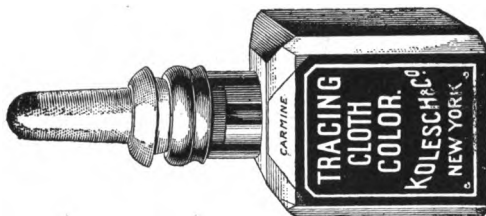
- 6483** Tubes.each, \$.75 Double Tubes.each, \$1.25 Glass Pots.each, \$1.25
 Cadmium Yellow, Lemon (Jaune de cadmium citron) Cadmium Orange (Jaune de cadmium rouge)
 **Cadmium Yellow, Light (Jaune de cadmium clair) Cobalt Blue (Bleu de cobalt)
 Cobalt Green (Vert de cobalt)
 **Cadmium Yellow Middle (Jaune de cadmium moyen) Cobalt Violet (Violet de cobalt)
 **Cadmium Yellow, Deep (Jaune de cadmium foncé) **Indian Yellow (Jaune indien)
 Intense Blue (Bleu Intense)

SERIES V.

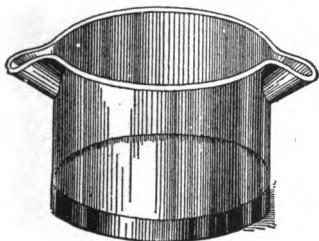
- 6484** Tubes.each, \$1.00 Double Tubes.each, \$1.50 Glass Pots.each, \$1.50
 Burnt Carmine (Carmin brulée) Gallstone (Pierre de fiel)
 Carmine I quality (Carmine extra) *Pure Scarlet (Ecarlate)
 Saffron Yellow (Safran)

SERIES VI.

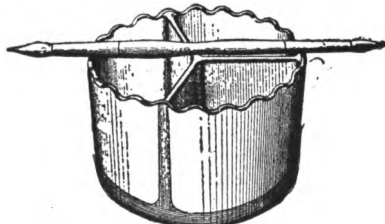
- 6485** Tubes.each, \$1.50 Double Tubes.each, \$2.25 Glass Pots.each, \$2.25
 *Aureolin (Aureoline) Smalt (Smalt)
 Madder Carmine (Carmin de garance)



- 6486** Liquid Tracing Cloth Colors. Will not wrinkle or soil the tracing cloth. Can be applied with a brush or pen.
 Red, Blue Yellow, Green, Brown.
 One ounce bottle with glass stopper.....per doz., \$3.00 each, \$.25



Nos. 6491-6493



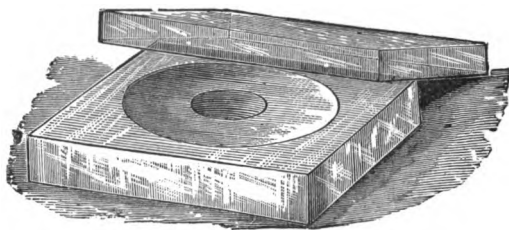
Nos. 6494-6495

Artists' Water Glasses.

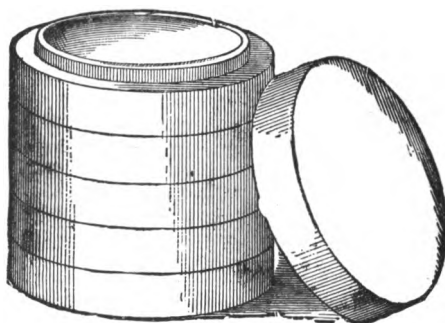
- 6491** Large, 3½ in. diameter, 2½ in. high, with two lips.....each, \$.30
6492 Medium, 3 in. diameter, 2¼ in. high, with two lips..... " .20
6493 Small, 2½ in. diameter, 2 in. high, with two lips..... " .15
6494 Three Compartment Glass, Large, 4¾ in. diameter, 3½ in. high " .95
6495 Three Compartment Glass, Small, 4 in. diameter, 2¾ in. high " .45



Ink and Color Slabs and Tiles.



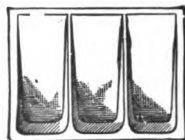
- 6496** Slate Ink Slab, with heavy glass cover, $3\frac{1}{2} \times 3\frac{1}{2}$ in.....each, \$.35



- 6500** Nests of Cabinet Saucers, 6 in set, $2\frac{3}{8}$ in.....each, \$.45
6502 Nests of Cabinet Saucers, 6 in set, $2\frac{3}{8}$ in..... " .55
6504 Nests of Cabinet Saucers, 6 in set, $3\frac{1}{4}$ in..... " .65
6506 Nests of Cabinet Saucers, 6 in set, $3\frac{3}{4}$ in..... " .75



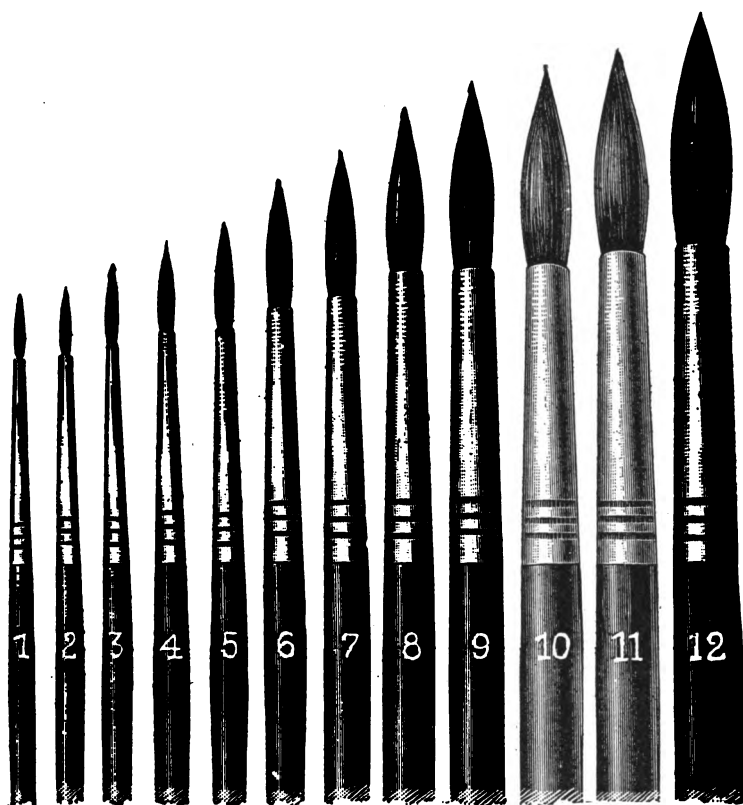
6510



6515

- 6510** Color Slabs, 3 wells and slope, 2×4 in.....each, \$.20
6511 Color Slabs, 3 wells and 3 slopes, $2\frac{1}{2} \times 4$ in..... " .25
6512 Color Slabs, 5 wells and 5 slopes, $4 \times 7\frac{1}{2}$ in..... " .60
6515 Sloping Tile, 3 divisions, $2\frac{1}{2} \times 4$ in..... " .15
6516 Sloping Tile, 4 divisions, 3×8 in..... " .30
6518 Sloping Tile, 6 divisions, $3\frac{1}{2} \times 8$ in..... " .40
6520 Sloping Tile, 8 divisions, $6 \times 7\frac{3}{4}$ in..... " .50
6522 Sloping Tile, 10 divisions, $6 \times 7\frac{3}{4}$ in..... " .55
6524 Sloping Tile, 12 divisions, $6 \times 7\frac{3}{4}$ in..... " .65

Water Color Brushes



Illustrations, Full Size

6525 Red Sable, Black Handles, with nickel plated ferrules; domestic manufacture:

Nos.	00	0	1	2	3	4	5	6	7	8	9	10	11	12
Doz.	\$1.00	1.20	1.30	1.50	2.00	2.30	2.50	3.50	5.50	7.50	9.50	11.50	16.00	19.00
Each,	.10	.12	.13	.15	.20	.23	.25	.35	.55	.75	.95	1.15	1.60	1.90

6526 Winsor & Newton's Red Sable, Ebony Handles, with Albata Ferrules:

Nos.	00	0	1	2	3	4	5	6	7
Doz.,	\$3.60	3.60	3.60	4.80	6.00	7.20	9.00	10.80	13.20
Each,	.30	.30	.30	.40	.50	.60	.75	.90	1.10

6527 Winsor & Newton's Red Sable, Walnut Handles, with nickel plated Ferrules:

Nos.,	00	0	1	2	3	4	5	6	7	8	9	10	11	12
Doz.,	\$2.00	2.00	2.20	2.70	3.20	3.90	4.60	6.60	8.80	11.80	16.00	20.00	25.00	30.00
Each,	.20	.20	.20	.25	.30	.35	.40	.60	.75	1.00	1.35	1.70	2.10	2.50



"Fulton" Red Sable Brushes in Quills, Extra Long Hair

For Designers and Illustrators. Best Selected Quality of Pure Red Sable.
Perfect Long and Slender Points

6528 "Fulton" Red Sable Brushes, in Quills:

	0	1	2	3	4	5	6	7
Diameter,	7/64	6/64	5/64	4/64	4/64	3/64	3/64	2/64 in.
Length of point,	16/16	15/16	14/16	13/16	12/16	11/16	10/16	9/16
Dozen,	\$12.50	11.00	9.00	7.00	6.00	5.00	3.50	3.00
Each,	1.25	1.10	.90	.70	.60	.50	.35	.30

Bright's Flat Red Sable Brushes

6529 Bright's Flat Red Sable Brushes, best quality, short hair, long wooden handles:

	1	2	3	4	5	6	7	8	9	10	11	12
Diameter,	3/32	4/32	5/32	6/32	7/32	8/32	9/32	10/32	12/32	13/32	14/32	15/32
Dozen,	\$1.50	1.75	2.25	2.65	3.00	3.40	3.75	4.10	4.50	6.00	7.50	9.00
Each,	.15	.18	.23	.26	.30	.34	.37	.41	.45	.60	.75	.90

Bright's Flat Red Sable Brushes, Extra Thick

6533 Bright's Flat Red Sable Brushes, best quality, extra thick, polished handles:

	1/4	3/8	1/2	5/8	3/4	7/8 in.
Diameter,						
Doz.,	\$4.50	6.00	9.00	13.50	16.00	22.50
Each,	.45	.60	.90	1.35	1.65	2.25

Rigger's Round Red Sable Brushes

6534 Rigger's Round Red Sable Brushes, extra long slender points, long handles. Smallest size is 9/32 inches long and 2/32 diameter. From this size up to No. 12, the length of hair increases with each brush about 2/32 inches and the diameter increases about 1/64 inch, largest size being 1 inch long, and 6/32 diameter:

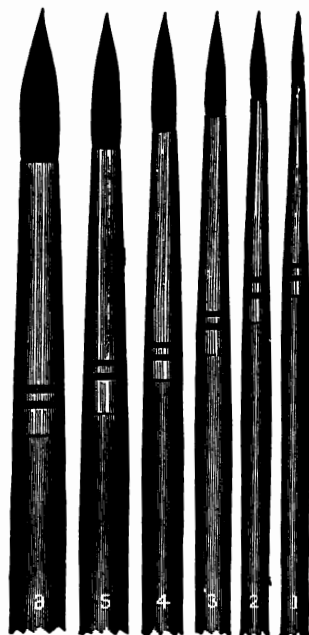
Nos.	1	2	3	4	5	6	7	8	9	10	11	12
Doz.,	\$1.45	1.60	1.90	2.25	2.50	2.85	3.20	4.60	5.25	5.75	7.20	9.00
Each,	.14	.16	.19	.22	.25	.28	.32	.46	.52	.57	.72	.90

English Flat Red Sable Wash Brushes

6535 English Flat Red Sable Wash Brush, polished handles:

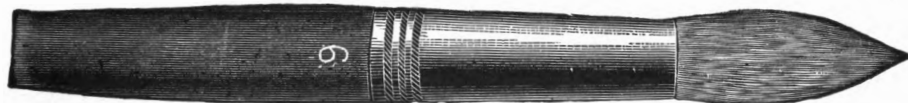
1 inch wideper doz., \$7.20 each, \$.72

Water Color Brushes — Continued.



6536 Camel Hair Brushes, with handles :

Nos.	1	2	3	4	5	6
Each, \$	.06	.06	.08	.10	.10	.12



6537 Camel Hair, Sky or Wash Brushes, with handles :

Nos.	1	2	3	4	5	6
Each, \$	.15	.20	.25	.30	.35	.40

6539 Double Pointed Camel Hair Brushes :

Nos.	0	1	2	3
Each, \$	.45	.50	.55	.60



Flat Ox-Hair Water Color Brushes

6540 Flat Ox Hair Wash Brushes, polished wooden handles:

Nos.	0	1	2	3	4
Diameter,	5/16	6/16	9/16	10/16	11/16
Per dozen,	\$1.40	1.50	1.95	2.35	2.75
Each,	.14	.15	.20	.25	.30

Artists' Bristle Brushes

6541 Artists' Bristle Brushes. Long wooden handles:

Nos.	1	2	3	4	5	6	7	8	9	10	11	12
Dozen,	\$.85	.90	.95	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80
Each,	.09	.09	.10	.10	.11	.12	.13	.14	.15	.16	.17	.18

Paste Brushes

6542 Paste Brushes. Best quality black bristles, red polished handles:

Size,	½ in.	¾ in.	⅞ in.	1 in.	1¼ in.	1½ in.
Per dozen,	\$1.50	2.10	2.30	2.60	3.60	5.60
Each,	.15	.21	.23	.26	.36	.56

Photo Engravers' Camel Hair Brushes

6543 Photo Engravers' Camel Hair Brushes, set in hard rubber so that the chemicals used with these brushes will not loosen the hair:

Size,	½ in.	1 in.	1½ in.	2 in.	2½ in.	3 in.	3½ in.	4 in.	5 in.
Per doz.,	\$4.75	5.40	8.50	12.30	16.00	19.45	25.40	30.00	45.00
Each,	.48	.54	.85	1.25	1.60	1.95	2.55	3.00	4.50

6544 Photo Engravers' Camel Hair Brushes, extra thick and extra long, set in rubber:

Size,	1 in.	1½ in.	2 in.	2½ in.	3 in.	3½ in.	4 in.	5 in.
Per doz.,	\$7.10	11.50	14.50	17.80	22.60	32.00	39.00	64.00
Each,	.75	1.15	1.45	1.80	2.30	3.20	3.90	6.40

Photographers' Paste Brushes

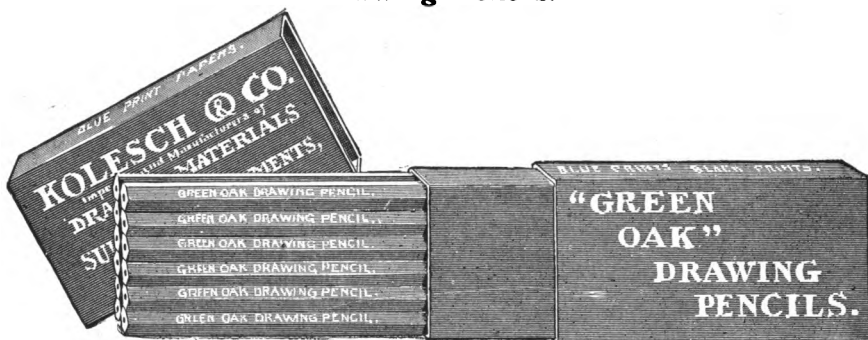
6545 Photographers' Paste Brushes, white bristles, set in hard rubber:

Size,	½ in.	1 in.	1½ in.	2 in.	2½ in.	3 in.	3½ in.	4 in.	5 in.	6 in.
Per doz.,	\$2.50	3.00	3.70	4.70	6.00	7.20	9.60	12.00	17.00	21.00
Each,	.25	.30	.37	.47	.60	.72	.96	1.20	1.70	2.10

Ebony Handles for Quill Brushes

6546 Ebony Handles for Quill Brushesper dozen, \$1.00 each, \$.10

Drawing Pencils.



6550 Green Oak Drawing Pencil, made of compressed lead of the very best quality, free from grit and of uniform grading. Made in 11 degrees of hardness :

7H, 6H, 4H, 3H, 2H, H, F, HB, B, 2B, 5B,

Per box of 1 dozen..... \$ 1.00

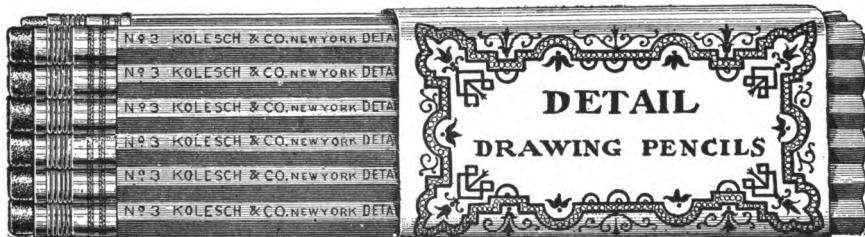
Per gross..... 10.00



6555 Detail Drawing Pencils, made especially for the use of Architects, Engineers and Designers, to supply the want of a good quality of pencil at a reasonable price. Made in 5 degrees of hardness, Nos. 1, 2, 3, 4, 5 :

Per dozen..... \$.47

Per gross..... 5.65



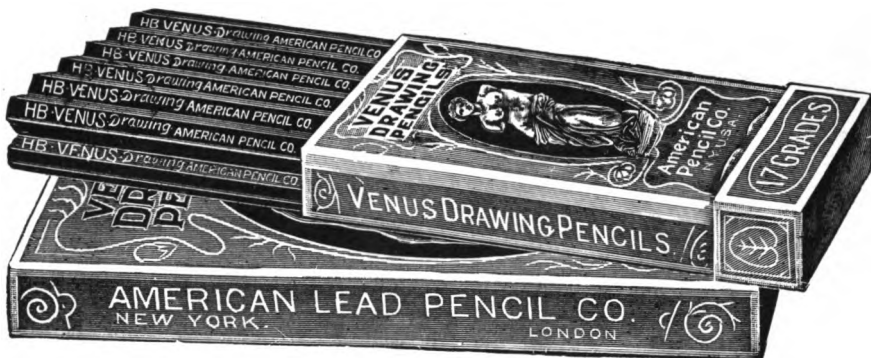
6560 Detail Drawing Pencil, with Rubber Tip. Quality same as No. 6555. Made in 2 degrees of hardness, Nos. 2 and 3 :

Per dozen..... \$.52

Per gross..... 6.25



Drawing Pencils—Continued.



- 6568** Venus Drawing Pencils, compressed lead. Made in 17 degrees of hardness: 9H, 8H, 7H, 6H, 5H, 4H, 3H, 2H, H, F, HB, B, 2B, 3B, 4B, 5B, 6B.

Per dozen, \$1.00; per gross, \$10.00

Venus Superfine Copying Ink Pencils:

Per dozen, \$1.00; per gross, \$10.00

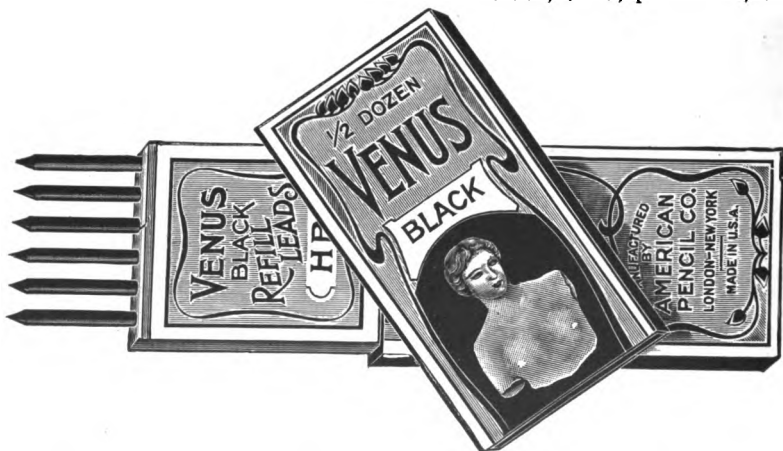
Venus Copying Pencils: Ordinary quality.

Per dozen, \$.85; per gross, \$8.50



- 6569** Venus Artist Pencils, with movable leads. Made in 17 degrees of hardness:

Each, \$.25; per dozen, \$2.50



- 6570** Venus Leads (refills) for Artist Pencils. Made in 17 degrees of hardness:

Per box of 6 Leads.....Each, \$.54; per dozen boxes, \$5.40

Drawing Pencils—Continued

FIELD BOOK PENCIL

- 6575 Field Book Pencil.** Particularly adapted for the use that its name implies, i. e., in connection with the field book. The flat shape of this pencil allows it to be laid into the book without breaking the binding. Further, it is handy as a straight edge, for ruling lines. Made of the best quality lead, and of a degree of hardness suitable for such work:

Per box of one dozen..... \$1.10
Per gross 11.70

- 6581 Koh-i-noor Drawing Pencils,** made in 17 degrees of hardness, 9H-6B, one dozen in a box:

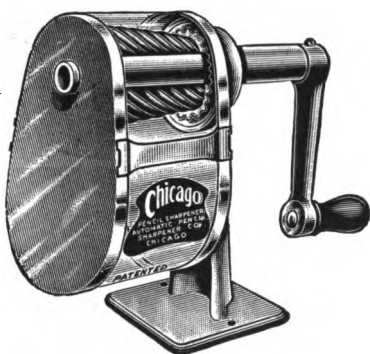
Per dozen \$1.25
Per gross 12.50

- 6585 Castell Drawing Pencils,** made in 16 degrees of hardness, 8H-6B, packed one dozen in a neat metal box:

Per dozen \$1.25
Per gross 12.50

- 6595 Paper Pencils,** 1 dozen in a box, Red, Blue, Yellow, Green, Brown and Black:

Per dozen \$.95



6601

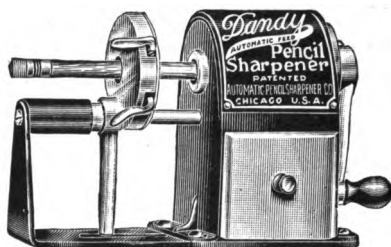


6602

- 6601 Chicago Long Point Pencil Sharpener.** Sharpens regular size pencils with a long point which is desirable for draftsmen, architects and artists. Twin milling cutter, Hand Feed, 4 inches high by $3\frac{1}{2}$ inches long..... each, \$1.00

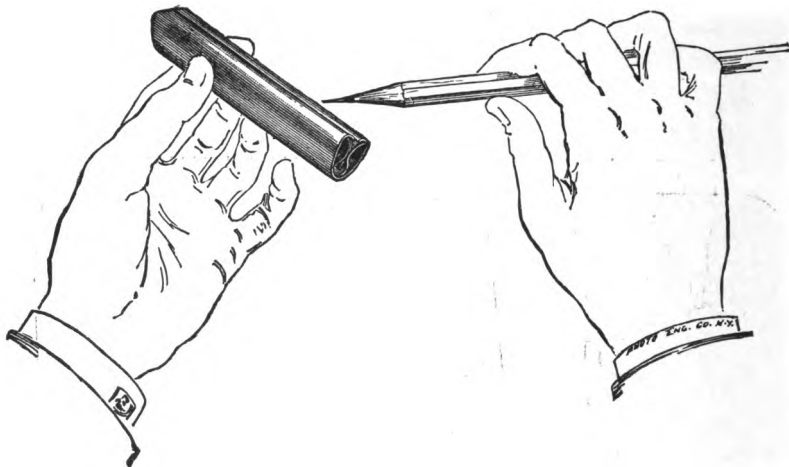
- 6602 Chicago Giant Sharpener,** like the above (No. 6601), except that it points all sizes of pencils. Suitable for pointing very soft pencils, crayons, etc..... each, \$1.50
Extra cutters for above, per pair..... 50c.

Pencil Sharpeners—Continued.



The Dandy has two milling cutters and automatic feed. The adjustment permits pencils to be sharpened with three different styles of points—short, medium and long. Six inches long, $\frac{3}{4}$ inches high. Finished in rich black enamel, with nickel trimmings.

6606	Dandy Pencil Sharpener	\$4.00
6607	Extra Cutters, per pair .....	.75
	Resharpener Cutters, per pair .....	.50



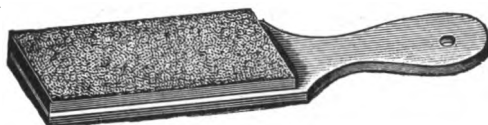
6610	Duplex Pencil Sharpener (nickel plated case) ..each, \$.15	doz, \$1.50
6612	Reserve sheets of emery cloth.....	per package, .05

The "Duplex" Pencil Pointer is a new and improved device for sharpening a lead pencil in a few moments' time to the very finest point, either round or knife edged.

The Emery Cloth, which forms the abrading surfaces, will last for months; but if worn may be replaced by pushing out the inside holder, in which a new sheet can be easily inserted.

To give the pencil a flat edge, press the point lightly in the groove of the sharpener and draw lengthwise from end to end, or if a round point is required, roll the pencil between the thumb and fingers as shown in cut, taking care not to grind the point.

Pencil Pointers and Point Protectors



6616

6615	Pencil Pointers (sand paper pads), plain, 1½x4 in.	each, \$.10	per doz., \$1.00
6616	Pencil Pointers (sand paper pads), on wood handles	" .15	" 1.50
6617	Pencil Pointers (emery paper pads), plain	" .18	" 1.80
6618	Pencil Pointers (emery paper pads), on wood handles	" .20	" 2.00



6620	Steel Pencil File and Tack Lifter, 7¾ in.	per doz., \$2.50	each, \$.25
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6625	"Fulton" Pencil Holder, for using up short ends of pencils	per doz., \$1.25	each, \$.12
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Pencil Point Protectors



6630	Pencil Point Protector, with inserted Rubber.....	per doz., \$.50	
	Extra Rubbers for same.....	"	.15



6632	Cartridge Point Protector, for lead pencils.....	per doz., \$.25	
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6634	Eagle Pencil Tips, with rubber ends, large.....	per doz., \$.50	
6635	Eagle Pencil Tips, with rubber ends, small.....	"	.15
6636	Extra Rubbers for same.....	"	.15



Surveyor's Marking Crayons for Marking Stakes, etc.



- 6643 "Beekman" Crayons**, for surveyors' use for marking stakes, etc. Finest obtainable quality of crayon. **Waterproof.** Marks made with this crayon will stand exposure to the rain, sun or snow for many years. This feature makes this crayon a popular article among the profession. In sticks $4\frac{1}{2}$ in. long, hexagonal in shape and $\frac{1}{2}$ in. in diameter. Paper covered, packed one dozen in a box. Made in 5 colors: Red, Blue, Green, Yellow and White, Per gross, \$10.00.....per dozen, \$1.00.....each, \$.10



- 6645 "Nassau" Crayons**, for surveyors' use. The only crayon that will mark on a wet stake. **Waterproof.** Marks made with this crayon will last for years. Fine quality, slightly softer than the "Beekman" crayon. In round sticks, $4\frac{1}{2}$ in. long, $\frac{1}{2}$ in. in diameter. Paper covered, packed one dozen in a box. Made in two colors, Red and Blue. Per gross, \$5.00.....per dozen, \$.50.....each, \$.05



- 6646 Soap Stone Crayon**, for burnishing tracing cloth after erasing, and for marking on metal. Per gross, \$3.50.....per dozen, \$.50.....each, \$.05

Dixon's Crayons

- 6650 Dixon's Marking Crayons**, round, 7 inches long, $\frac{5}{16}$ in. diameter. Are made of solid crayon, wax finish, paper covered. For surveyors' and architects' use. Red, Blue, Yellow, Green, Brown, Terra Cotta, Black, Violet, Pink, Sepia, Orange. Packed one dozen in paper box. Per gross, \$11.25.....per dozen, \$ 1.10.....each, \$.11
- 6651 Crayon Holders**, $4\frac{1}{2}$ in. long, for crayons No. 6650. Per dozen, \$.50.....each, \$.05
- 6652 Dixon's Lumber Crayons**, $4\frac{1}{2}$ in. long, $\frac{1}{2}$ in. diameter, paper covered, for surveyors' use. Red, Blue, Green, Yellow, Brown, Terra Cotta, White. Per Gross, \$10.80.....per dozen, \$1.10.....each, \$.11

Colored Crayons

6653 "Castell" Polychromos Colored Pencils. Made by A. W. Faber; 7 inches long. Color of pencil indicated by outside polish of wood. Made in the following various tints.....per dozen, \$1.00 each, \$.10

1 White	20 Prussian Green	41 Raw Sienna
2 Zinc Yellow	21 Light Blue	42 Gold Ochre
3 Lemon Cadmium	22 Sky Blue	43 Burnt Yellow
4 Light Chrome	23 Cobalt Blue	Ochre
5 Light Cadmium	24 Ultramarine	44 Brown Ochre
6 Dark Cadmium	25 Paris Blue	45 Burnt Sienna
7 Naples Yellow	26 Prussian Blue	46 Venetian Red
8 Dark Chrome	27 Indigo	47 Brick Red
9 Orange	28 Delft Blue	48 Terra Cotta
10 Terre Verte	29 Red Violet Lake	49 Indian Red
11 Olive Green	30 Blue Violet Lake	50 Burnt Carmine
12 Mineral Green	31 Pink Madder Lake	51 Raw Umber
13 French Green	32 Madder Carmine	52 Bistre
14 Green Bice	33 Rose Pink	53 Vandyke Brown
15 Sap Green	34 Carmine Lake	54 Burnt Umber
16 Hooker's Green	35 Carmine, extra fine	55 Sepia
No. 1	36 Scarlet Lake	56 Warm Sepia
17 Hooker's Green	37 Saturn Red	57 Light Grey
No. 2	38 Pale Vermilion	58 Neutral Tint
18 Viridian	39 Dark Vermilion	59 Payne's Grey
19 Vegetable Green	40 Light Ochre	60 Ivory Black

6654 Cabinets of "Castell" Polychromos Colored Pencils in assorted colors:

Box of.....	6	12	18	24	36	48	60 colors
Each	\$.60	.90	1.35	1.80	2.40	3.30	4.50

Cabinets of "Castell" Colored Pencils, $4\frac{1}{4}$ Inches Long

6656 Mechanical Engineer's Assortment, containing one crayon each of Nos. 58, 29, 26, 16, 35, 8, 5, 21, 38, 53, 45, 44.....each \$.45

6658 Electrical Engineer's Assortment, containing one crayon each of Nos. 58, 29, 16, 35, 8, 5, 21, 38, 53, 14, 60, 26..... " .45

6659 Sketching Assortment, containing one crayon each of Nos. 14, 35, 5, 45, 27, 38, 16, 9, 58, 52, 29, 30..... " .45



Best Quality Colored Pencils.

6660	Faber's Hexagon, red and blue, in wood.....	per doz., \$1.25
6661	Faber's Round, red, in wood.....	" 1.00
6662	Faber's Round, blue, in wood.....	" 1.00
6663	Faber's Round, green	" 1.00

Second Quality Colored Pencils

6665	Colored Crayons, round, in wood, red, blue yellow, green, brown	per doz., \$.60
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Conte Crayons and Crayon Pencils

6666	Conte Crayon Pencils, extra fine quality, No. 0, very hard	per doz., \$1.00
6667	Conte Crayon Pencils, extra fine quality, No. 1, hard.	" 1.00
6668	Conte Crayon Pencils, extra fine quality, No. 2, medium	" 1.00
6669	Conte Crayon Pencils, extra fine quality, No. 3, soft.	" 1.00
6672	Conte Crayon Pencils, ordinary, No. 1, hard.....	" .60
6673	Conte Crayon Pencils, ordinary, No. 2, medium.....	" .60
6674	Conte Crayon Pencils, ordinary, No. 3, soft.....	" .60
6677	Conte Crayons., black, sq., Nos. 1, 2, 3.gross, \$1.60	" .15
6678	Conte Crayons, black, round, Nos. 1, 2, 3.	" 3.50 " .35

Wolff's Carbon Drawing Pencils

6679	Wolff's Carbon Drawing Pencils, HH, H, HB, B, BB	per doz., \$1.00 each, \$.10
6679½	Wolff's Carbon Drawing Pencils, 3B....	" 2.00 " .20

Korn's Lithographic Crayon Paper Pencils.

6682	Korn's Lithographic Crayon Paper Pencils, used by lithographers, artists and designers for sketching and drawing. Made in 5 de- grees: No. 1, soft; No. 2, medium; No. 3, hard; No. 4, extra hard; No. 5, copal hard. Packed one dozen in a box.....	per doz., \$1.20 each, \$.12
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Korn's Lithographic Crayons.

6683	Korn's Lithographic Crayons, made in 6 degrees: Nos. 0, 1, 2, 3, 4, 5. Packed one dozen in a box.....	per gross, \$3.00 per doz., \$.25
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Lecturer's Chalk Crayons

6684 Lecturer's Chalk Crayons, made in the following colors: Black, crimson, dark blue, dark green, dark red, dark yellow, dull flesh, flesh, light blue, light green, light yellow, magenta, medium blue, medium green, medium yellow, purple, scarlet, umber, ultramarine, white.

Size, 1x1x3 inches.

Size, $\frac{1}{2} \times \frac{1}{2} \times 3$ inches.

White, per box of one dozen. \$.50

White, per box of one dozen. \$.40

Scarlet and crimson..... 1.80

Scarlet and crimson..... 1.25

Other colors 1.25

Other colors75

Charcoal

6686 Conté Charcoal, best quality, 50 sticks.....per box, \$.50

6687 Ordinary Charcoal, 50 sticks " .15

Fixatif

6688 Fixatif, for crayon or charcoal:

	Pint	$\frac{1}{2}$ Pint	2 oz. bot.
Each	\$1.20	.75	.25

Nonpareil Gelatine Solution for Photo Retouching and for Fixing Charcoal, Crayon, Pencil and Pastel Drawings.

6689 Nonpareil Solution, contains no acetic acid and will not change the most delicate tints:

3 oz. bottlesper dozen, \$3.00 per bottle, \$.30

Atomizers



6690 Atomizers, of tin, folding.....each, \$.15

6691 Atomizers, of glass..... " .25

Crayon Holders

6692 Crayon Holders, brass, 5 in.....each, \$.05 per doz., \$.50

6693 Crayon Holders, brass, 6 in..... " .06 " .60

Stumps

6694 Leather Stumps, for crayon shading, Nos. 1-8, assorted..per doz., \$1.00

6695 Paper Stumps, for crayon shading, Nos. 1-8, assorted.. " .25

6696 Paper Stumps, small (Tortillons)..... " .10

6697 Rubber Stumps (Nigrivorine), $2\frac{1}{2}$ in. long..... " .50

6698 Rubber Stumps (Nigrivorine), 3 in. long..... " .70

6699 Rubber Stumps (Nigrivorine), 4 in. long..... " .90



Rubbers and Erasers



- 6700** "Bleecker" Rubber, a pure emerald green pencil rubber of great elasticity and best erasing qualities, smoothly finished and beveled on both ends. The best rubber for erasing ink lines from tracing cloth; though it may take a trifle longer, it will not cut the cloth like an ink eraser.

Large, $3\frac{3}{4} \times 15/16 \times \frac{5}{8}$ in.....	per doz., \$1.90	each, \$.20
Medium, $3\frac{1}{2} \times \frac{5}{8} \times 7/16$ in.....	" 1.00	" .10
Small, $2\frac{5}{8} \times \frac{5}{8} \times 5/16$ in.....	" .50	" .05



- 6706** "Beekman" Rubber, a soft flexible pencil rubber of ruby red color. Will erase pencil marks without defacing the surface of the drawing.

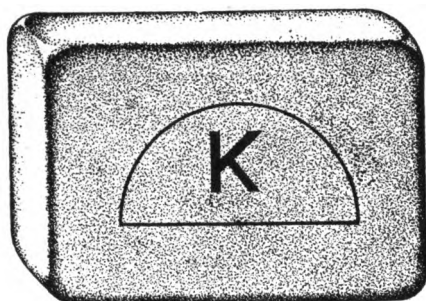
Large, $3\frac{3}{4} \times 15/16 \times \frac{5}{8}$ in.....	per doz., \$1.90	each, \$.20
Medium, $3\frac{1}{2} \times \frac{5}{8} \times 7/16$ in.....	" 1.00	" .10
Small, $2\frac{5}{8} \times \frac{5}{8} \times 5/16$ in.....	" .50	" .05



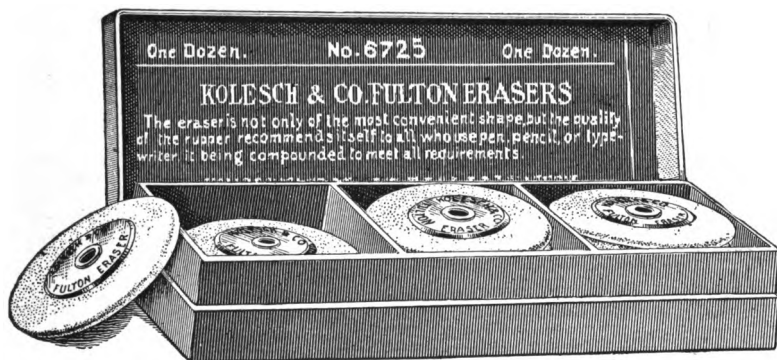
- 6710** White Sponge Rubber, a cleaner for drawings and tracings; will remove pencil lines without affecting the ink lines; will not affect the surface of the paper or cloth. Does not smut.

Small, $1\frac{1}{2} \times 1\frac{1}{2} \times 1$ in.....	cake, \$.08	per doz., \$.80
Large, $1\frac{1}{2} \times 3 \times 1$	" .15	" 1.50

Rubbers and Dusters

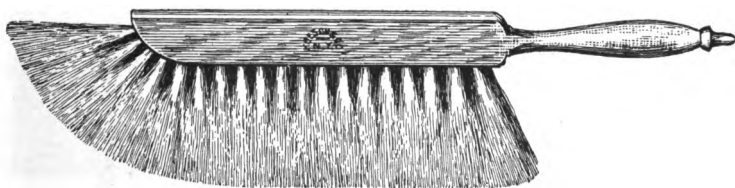


- 6715** Pliable Rubber, grey, a very soft rubber for erasing pencil marks, and for cleaning drawings.
- | | | | | | |
|---------|---------------|----------|-----|------|--------|
| Small, | 20 to lb..... | cake, \$ | .12 | lb., | \$2.25 |
| Medium, | 12 to lb..... | " | .20 | " | 2.25 |
| Large, | 8 to lb..... | " | .30 | " | 2.25 |
- 6717** Pliable Rubber, pink.
- | | | | | | |
|---------|---------------|---|-----|---|------|
| Small, | 20 to lb..... | " | .12 | " | 2.25 |
| Medium, | 12 to lb..... | " | .20 | " | 2.25 |
| Large, | 8 to lb..... | " | .30 | " | 2.25 |



- 6725** Fulton Circular Eraser, for ink and pencil.
One dozen in box.....per box, \$.60 each, \$.06

Dusters



- 6740** For removing dust, rubber crumbs, etc., from drawingsper doz., \$7.50 each, \$.75



Rubbers and Erasers—Continued



6729 Typewriter Eraser, small:

$2\frac{7}{8} \times \frac{1}{2} \times \frac{5}{16}$; per dozen, \$.50; each, \$.05

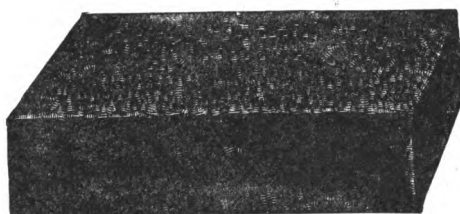
6730 Typewriter Eraser, large:

$3\frac{1}{2} \times \frac{5}{8} \times \frac{3}{8}$; per dozen, \$1.00; each, \$.10

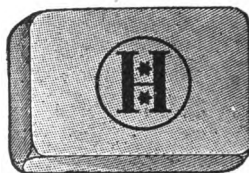


6735 Ink-Pencil Eraser:

$3\frac{1}{4} \times \frac{5}{8} \times \frac{1}{4}$; per dozen, \$.50; each, \$.05



6741



6743

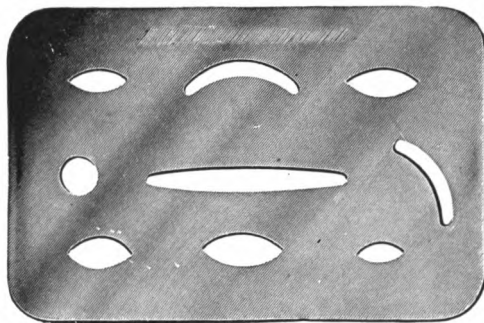
6741 Sponge Rubber, for cleaning drawings:

	1x1x1 in.	2x1 $\frac{1}{4}$ x1 in.	4x2x1 in.
Each	\$.10	.25	.60

6742 Faber's Kneaded Rubber.....per doz., \$1.00 each, \$.10

6743 Hardtmuth's Pliable Rubber, Grey or Pink:

	20 to lb.	12 to lb.	8 to lb.
Per lb.	\$2.75	2.75	2.75
Each .....	.15	.25	.35



- 6754 Erasing Shield, Swedish Spring Steel, tempered. per doz., \$2.00 each, \$.20
 6755 Erasing Shield, German Silver..... " 2.00 " .20
 6756 Erasing Shield, Transparent Celluloid..... 2.00 " .20

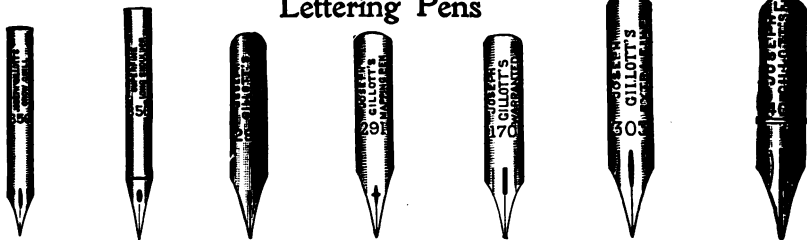


- 6760 Steel Erasers, wooden handle (domestic).....each, \$.35
 6761 Steel Erasers, wooden handle (Rodgers)..... " .60



- 6765 Steel Erasers, wooden handle (domestic).....each, \$.45
 6766 Steel Erasers, wooden handle (Rodgers)..... " .70

Lettering Pens



- 6775 Gillott's Crow Quill Pens, No. 659, 1 doz. and holder on a card.....per gross, \$6.00 dozen, \$.60
 6776 Gillott's Crow Quill Pens, No. 850, 1 doz. and holder on a card (long shoulder)... " 7.50 " .75
 6777 Gillott's Lithographic Pens, No. 290, 1 doz. and holder on a card..... " 6.00 " .60
 6778 Gillott's Mapping Pens, No. 291, 1 doz. and holder on a card..... " 6.00 " .60
 6779 Gillott's Mapping Pens, No. 170..... " 1.00 " .10
 6780 Gillott's Lettering Pens, No. 303..... " 1.50 " .15
 6781 Gillott's Lettering Pens, No. 404..... " .75 " .10
 6782 Gillott's Lettering Pens, No. 290, loose.. " 4.50 " .45
 6783 Gillott's Lettering Pens, No. 291, loose.. " 4.50 " .45
 6784 Gillott's Crow Quill Pens, No. 659, loose..per dozen, .50 each, .05
 6785 French Crow Quill Pens, on card with holder " .35 " .03

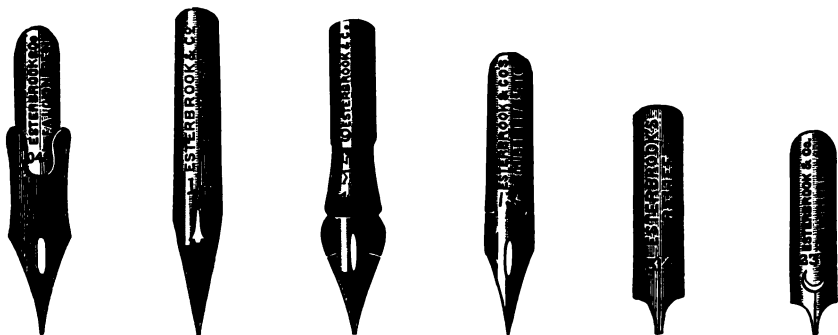


Pen Holder for Crow Quill Pens.

6788

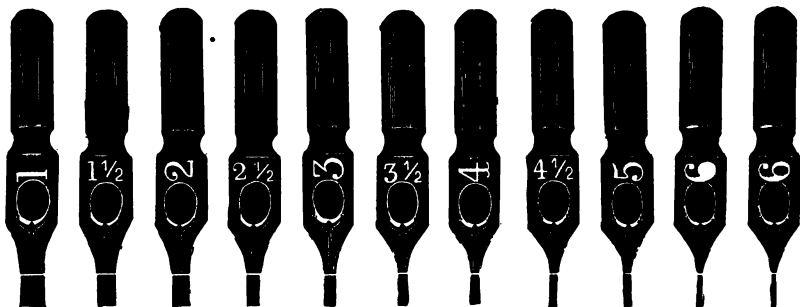
6788 Improved Pen Holder, for Crow Quills Nos. 659 and 850.....each, \$.06

Writing Pens.



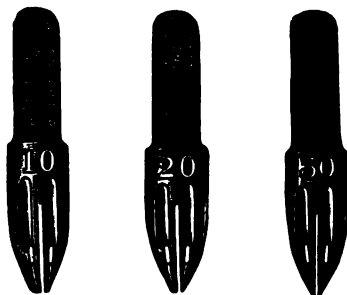
6790	Esterbrook's Falcon Pens, 048.....	per dozen, \$.10	per gross, \$.85
6791	Esterbrook's Bank Pens, 14.....	" .10	" .85
6792	Esterbrook's Amalgam, 92.....	" .10	" .85
6793	Esterbrook's Dbl. Elastic, 135.....	" .10	" .85
6794	Esterbrook's Relief, 314.....	" .12	" 1.00
6795	Esterbrook's Chancellor, 239.....	" .12	" 1.00
6797	Ball Pointed Pens, Nos. 506F, 506EF, 516F, 516EF.....	per gross, 1.20	

Round Writing Pens.



6800	Single Pointed Pens, box of 3 dozen of any one number.....	each, \$.25
	Single Pointed Pens, dozen of one kind or assorted.....	.10
	Single Pointed Pens, dozen assorted on card, with penholder	.20

Round Writing Pens—Continued



- 6805 Double Pointed Pens, box of 3 dozen of any one number..each, \$.65
 Double Pointed Pens, per dozen of one kind or assorted.. “ .35
 6809 Assortment of 25 Single and Double Pens, in box.....per box, .35



- 6810 Inkholders for Single Pointed Pens.....each, \$.05
 Box of 6 “ .25
 6815 Penholders for Round Writing Pens..... “ .10
 6816 Penholders for Round Writing Pens, double end..... “ .10

Books on Round Writing

- 6820 Round Writing Copy Book, with complete text.....each, \$.75
 6825 Round Writing Copy Book, no text..... “ .45

Lettering Alphabets

- 6830 Reinhardt's Lettering for Draftsmen (a practical system of free-hand lettering for working drawing), 44 illustration..... \$1.00
 6834 Cromwell, a system of easy lettering..... .50
 6836 The Ornamental Penman's, Engravers', Sign Writers' and Stone Cutters' Pocket Book of Alphabets..... .20
 6842 Meinhardt's Practical Lettering, with original system for spacing60
 6844 Rollinson's Alphabets and other material useful to letterers, 33 pages, 6¼x9½, cloth bound, 27 plates, each..... 1.00

For additional books on lettering, see page 323.



6850-6851



6852



6854



6860



6860



6860



6865



6867

- 6850** Penholders, medium, black polished handles, nickel plated tips, per doz., \$.50
6851 Penholders, medium, red " " " " .50
6852 Penholders, medium, with cork tips, polished handles..... " .60
6854 Penholders, long, polished handles..... " .50
6860 Crown Penholders.....per-doz., small, \$.50 medium, .55 large, .60
6865 Pen-Ejecting Penholders. By simply sliding back the rubber tip it readily ejects the pen without soiling the fingers.....per doz., .60
6867 Tapered Penholders, with corrugated hard rubber tip, so constructed that any size pen, from the smallest to the largest, will fit into the tip..... " .60

Writing Inks and Pastes.

- 6870 Stafford's Blue Black Office Ink (writing or copying):
Each.....quart, \$1.00 pint, .60 ½ pint, .45
- 6875 Carter's Combined Writing and Copying Ink:
Each.....quart, \$1.00 pint, .60 ½ pint, .45
- 6880 Stafford's Carmine Writing Ink:
Each.....quart, \$2.50 pint, 1.50 ½ pint, .85 2 oz., .25



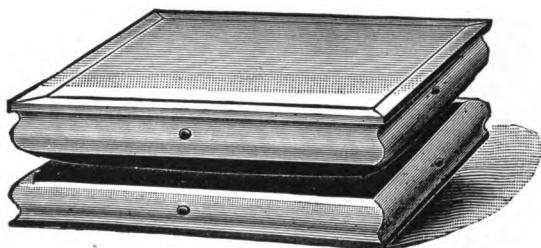
- 6885 Higgins' Taurine Mucilage:
Each.....quart, \$.80 pint, .50 ½ pint, .30 2 oz., .10
- 6890 Higgins' Photo Mounter:
Each.....gallon, \$3.50 ½ gallon, 2.00 14 oz., .50 6 oz., .25 3 oz., .15
- 6895 Higgins' Drawing Board Mucilage:
Each.....gallon, \$3.50 ½ gallon, 2.00 14 oz., .50 6 oz., .25 3 oz., .15



- 6900 Higgins' Vegetable Glue, a dense glue like paste, adapted for heavy work, such as stretching paper to drawing boards: 10 lb. 5 lb. 2 lb. 1 lb. ½ lb. can
Each.....\$1.75 1.00 .50 .25 .15
- 6905 Day's White Paste, a pure white scented paste of good quality:
Each.....large, \$.25 small, .15
- 6906 Day's White Paste, in 6 lb. Pails.....each, \$1.25



"Opaque" Quick-Drying Waterproof Ink and Pads



For stamping titles, etc., on tracings. Tracings stamped with this ink will produce clear and distinct blue prints. The special pads are sold in pairs and are made of fine quality hat felt. Soiling of hands is prevented by the moulding strips enclosing the pads proper. A label giving simple directions is attached to under side of pad:





6910 "Opaque" Quick Drying Ink:

Each	Pint	½ Pint	2 oz.	1 oz bottles
.....	\$2.50	1.50	.50	.25

6912 Pads, for using ink No. 6910:

	2 x 3 in.	3 x 4 in.	3 x 6 in.	4 x 7 in.	4 x 9 in.
Per pair.....	\$.30	.35	.50	.90	1.20

Rubber Bands (Best Quality)

		1½ in. long.
		1¼ in. long.
1/16 in. wide.		1½ in. long.
		1¾ in. long.

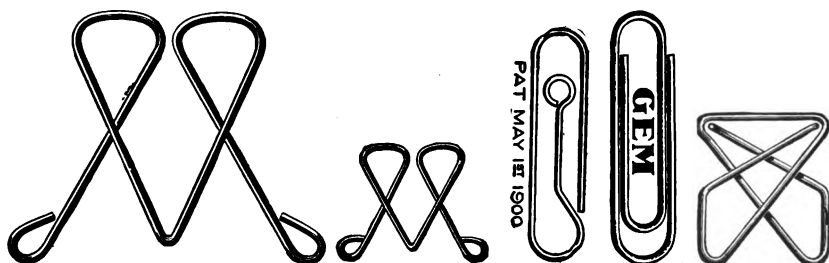
6915	1/16 in. wide:	1½	1¼	1½	1¾	2 in. long.
	Per ¼ lb. box of one kind or assorted,	\$1.00; per pound box, \$3.50.				
6916	⅛ in. wide:	1¾	1½	2	2½	3 in. long.
	Per ¼ lb. box of one kind or assorted,	\$1.00; per pound box, \$3.50.				
6917	¼ in. wide:	2	2½	3	3½	in. long.
	Per ¼ lb. box of one kind or assorted,	\$1.00; per pound box, \$3.50.				

Prices of Rubber Bands subject to change without notice.

Paper Fasteners.



6925	Round Heads, No. 1, $\frac{1}{4}$ in. long.	per box of 100, \$.18	per box of 1000, \$1.50
6926	Round Heads, No. 2, $\frac{1}{2}$ in. long.	" " .22	" " 1.80
6927	Round Heads, No. 3, $\frac{3}{4}$ in. long.	" " .29	" " 2.40
6928	Round Heads, No. 4, 1 in. long.	" " .36	" " 3.00
6930	Flat Heads, No. 1, $\frac{1}{4}$ in. long.	" " .14	" " 1.20
6931	Flat Heads, No. 2, $\frac{1}{2}$ in. long.	" " .18	" " 1.50
6932	Flat Heads, No. 3, $\frac{3}{4}$ in. long.	" " .22	" " 1.80
6933	Flat Heads, No. 4, 1 in. long.	" " .25	" " 2.10



6940
GIANT, FULL SIZE

6942
FULL SIZE

6944

6946

6948

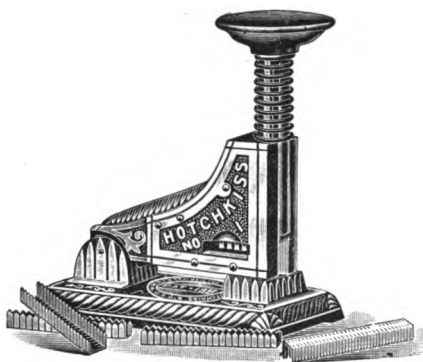
6940	Niagara Clips, Giant	per box of 100, \$.25	per box of 1000, \$2.25
6942	Niagara Clips, regular size	" " .15	" " 1.35
6944	L. B. Expansive Clips	" " .15	" " 1.35
6946	Gem Paper Clips	" " .15	" " 1.35
6948	Ideal Paper Clips	" " .15	" " 1.35



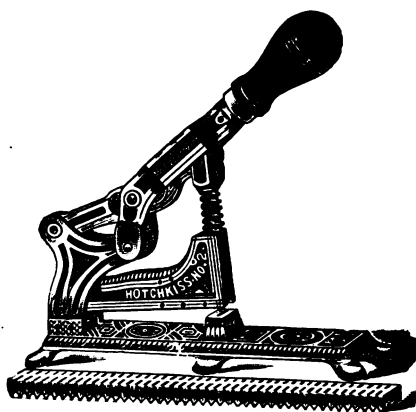
6949	Pyramid of Pins	each, \$.25	per box of 1 dozen, \$2.25
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Automatic Stapling Machines



6950



6953



6951, 6954, 6957

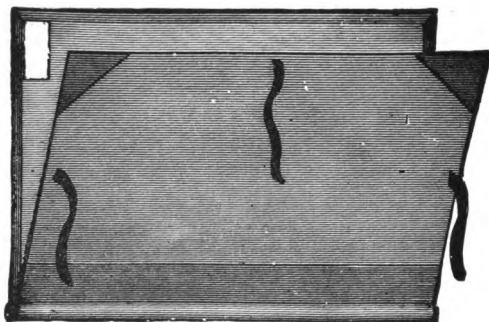
6950	Automatic Stapler No. 1, always loaded ready for use:	Each, \$1.50
6951	Extra Staples for No. 1, per 1,000.....	.50
6953	Automatic Stapler No. 2, for fastening 50 sheets of ordinary paper, length of bar, 10 in.....	" 4.00
6954	Extra Staples for No. 2, per 1,000.....	.90
6956	Automatic Stapler No. 3, same style as No. 1, but has double the capacity.....	" 3.00
6957	Extra Staples for No. 3, per 1,000.....	.90

Mending Tape



6960	Gummed Mending Tape, $\frac{7}{8}$ inch wide, for binding and mending drawings, blue prints, music, etc. White, red, grey, light green, dark green, ecru, brown, maroon, blue, black:	
	Rolls, 10 yards long.....	each, \$.12
	Per box of 1 dozen rolls, of one color or assorted.....	" 1.25

Portfolios



6965 Portfolios, best quality, with leather backs and corners, cloth sides and flaps:

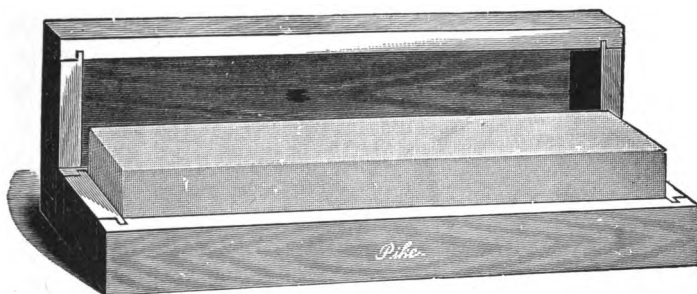
	11x16	17x22	20x26	22x31	32x42 inches
Each	\$1.00	1.75	2.10	3.00	6.60

6967 Portfolios, with cloth back and corners, paper sides:

	11x16	17x22	20x26	22x31	32x42 inches
Each	\$.50	.75	.90	1.45	4.25

Arkansas Oil Stones

Best Quality, Hard.



For sharpening Drawing Instruments, Knives, etc.

6970 Arkansas Oil Stones, in wooden cases, with cover:

	3 in.	4 in.	5 in.	6 in.	7 in.	8 in long
Each.....	\$.75	1.25	2.00	2.50	3.00	3.50

6974 Arkansas Oil Stones, wedge shape, for sharpening Ruling

Penseach, \$.50

6976 Bone Oil, for Oil Stones or Instruments.....per bottle, .25

Blotting Paper

6980 White or Blue, 19x24 inches.....per quire, \$1.50

6982 White or Blue, small size, package of 1 dozen..... " .06



Paper Weights



- 6990 Paper Weights, leather covered:
 Large, $3\frac{3}{4} \times 2\frac{3}{8} \times 1\frac{1}{4}$ in., weight $2\frac{1}{4}$ lbs.....per doz., \$5.00 each, \$.50
 Small, $2\frac{7}{8} \times 2 \times 1\frac{1}{4}$ in., weight $1\frac{1}{2}$ lbs..... " 4.50 " .45
- 6991 Shot Paper Weights, in sewed chamois bags. Will not dent the drawings like the solid weights, when set down hard or roughly:
 Large, weight 3 lbs.....per doz., \$12.50 each, \$1.25
 Small weight 2 lbs..... " 10.00 " 1.00
- 6992 Japanned Paper Weights, oblong, with knob, 3×5 in. $2\frac{1}{4}$ lbs. " .40
- 6994 Japanned Paper Weights, oblong, with knobs, $3 \times 7\frac{1}{2}$ in., $2\frac{3}{4}$ lbs. " .60
- 6996 Japanned Paper Weights, round, with knob, $1\frac{1}{2}$ lbs..... " .20

Specification and Typewriter Papers

- 7000 Typewriter Paper, 8×13 in., ruled, **thin**.....per ream, \$1.60
- 7001 Typewriter Paper, 8×13 in., plain, **thin**..... " 1.50
- 7002 Typewriter Paper, 8×13 in., ruled, **very thin**..... " 1.50
- 7003 Typewriter Paper, 8×13 in., plain, **very thin**..... " 1.35
- 7004 Typewriter Paper, 8×13 in., ruled, **medium**..... " 1.70
- 7005 Typewriter Paper, 8×13 in., plain, **medium**..... " 1.75
- Nos. 7000 and 7001 will make 6 copies; Nos. 7002 and 7003 will make 6 to 8 copies.

Specification and Note Pads

- 7010 White Paper, $8 \times 12\frac{1}{2}$ in., ruled, with border lineeach, \$.28 per doz. \$2.80
- 7011 White Paper, 8×10 in., ruled..... " .20 " 2.00
- 7012 White Paper, 5×8 in., ruled..... " .10 " 1.00
- 7013 White Paper, 8×10 in., plain..... " .18 " 1.75
- 7014 White Paper, 5×8 in., plain..... " .10 " .90
- 7015 Buff Paper, $8 \times 12\frac{1}{2}$ in., ruled, with border line " .27 " 2.65
- 7016 Buff Paper, 8×10 in., ruled..... " .22 " 2.15
- 7017 Buff Paper, 5×8 in., ruled..... " .11 " 1.10
- 7018 Buff Paper, 8×10 in., plain..... " .13 " 1.30
- 7019 Buff Paper, 5×8 in., plain..... " .07 " .65

See "Fulton" Figuring Books and Pads, page 37.



Amount \$ _____ Owner _____ Address _____ Contractor for _____ located at _____ under terms of contract dated _____ and amounting to \$ _____ payment of _____ DOLLARS.	191 This payment is not an acceptance of the work done until final payment is made and does not form any legal obligation on the part of the architect.
SUMMARY	
Amount of contract \$ _____ Extra work . . . \$ _____ Previous payment . \$ _____ Present payment . \$ _____ BALANCE \$ _____	191
Received the amount of the above certificate,	

Published by Kolesch & Co., 138 Fulton St., New York.

Architects' Certificate Books, new form which does away with writing a stub for each certificate. By employing the manifold system and using the best quality of pen-carbon, an exact fac-simile of the certificate is produced at one writing:

7025 Book of 100 certificates and 100 duplicates, each, \$1.00 3 Books, printed with name and address.....\$6.75
 6 Books, printed with name and address..... 9.50 1 Book, printed with name and address..... 2.75
 7027 Certificate Book, old form, with stubs.....each, .50

¾ of actual size.



Agreements Between Architect and Owner

Size of sheet, 6 $\frac{3}{4}$ x10 in.

(Printed here in reduced form to conform with size of this page)

and general working drawings (exclusive of details), three-fifths of the fee which would be due for complete services.

The architect's professional services consist of the necessary conferences, the preparation of preliminary studies, making of working drawings, specifications, large scale and full size detail drawings, and of the general direction and supervision of the work. Said supervision will include the examining and passing of accounts, and the visiting of the work by the architect or his deputy as often as shall be necessary to determine that the contract is being faithfully executed. Such supervision is not to be confused with the continuous personal superintendence which may be secured by the employment of a clerk of works, or superintendent of construction whose services, if engaged, shall be at the expense of the owner, but under the selection and sole authority of the architect.

The architect in his professional capacity acts simply as the agent of the owner, and as such incurs no pecuniary responsibility whatever.

Drawings and specifications as instruments of service are the property of the architect.

Necessary traveling expenses are to be paid by the owner, and any charges for special or expert services in connection with heating, ventilating or other mechanical work will be in addition to the above charges.

Radical changes in drawings or specifications will be charged extra.

.....Owner

.....

Published by Kolesch & Co., 138 Fulton St., N. Y.

.....19...

The undersigned hereby authorize

M.....Architect,

to furnish architectural services according to the customary schedule of charges as adopted by the American Institute of Architects.

Nature and Description of Building.....

Located at

Proposed cost.....

Commission will be at the rate of 6 per cent., based upon the total value of the work, inclusive of the cost of all interior fixtures and fittings for completed buildings.

On residential work, or alterations to existing buildings, on monuments, furniture, decorative and cabinet work and landscape architecture, it is proper to make a higher charge.

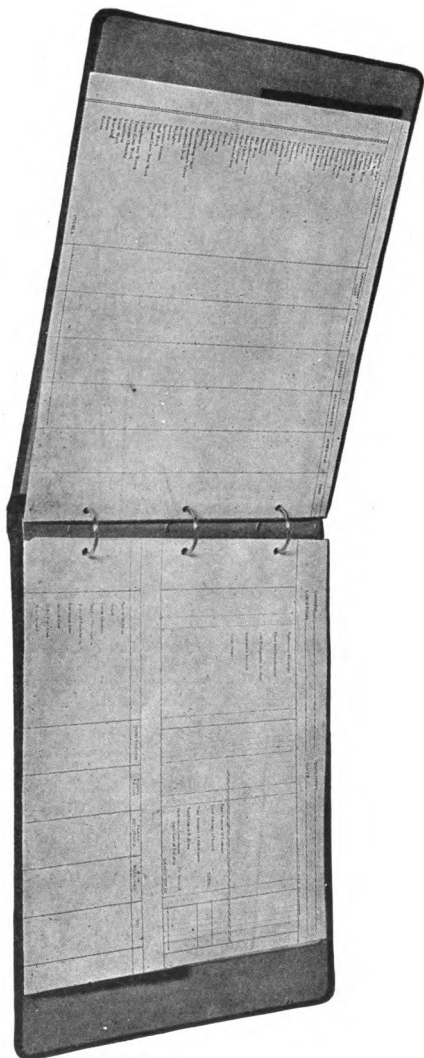
Payments to the architect are due as his work progresses in the following order: Upon completion of the preliminary studies, one-fifth of the entire fee; upon completion of specifications and general working drawings (exclusive of details), two-fifths additional; the remainder being due from time to time as the work progresses.

Until an actual estimate is received, charges are based upon the proposed cost of the work, and payments are received on account of the entire fee.

In case of abandonment or suspension of the work, the basis of settlement is to be as follows: For preliminary studies, a fee in accordance with the character and magnitude of the work; for preliminary studies, specifications

7029 Agreements between Architect and Owner, as above, giving Owner's consent in writing as to terms, prices, etc.
Per 100, \$1.50.....per 50, \$.95.....per dozen, \$.25.....each, \$.03

Architects' Record Book



Showing Book Open.

A simple, economical, practical record of details and costs of every building operation. Form which will show the architect instantly how each building operation stands and the cost of each part of the building. It keeps the notes and memoranda (in fact, every detail that could arise in a building operation) always up to date, each one properly indexed and accessible at a moment's notice.

It leaves nothing but live accounts, for, as soon as a building has been completed, the sheet is placed in the transfer binder for permanent record.

- 7031 Architects' Record Book consists of one Record Binder, bound in half black cowhide back and corners, cloth sides, lettered in gold, one leather tabbed index, A-Z, and 100 Record Sheets, size, $8\frac{3}{4} \times 11$ in., punched for bindereach, \$6.00
 - 7033 Architects' Record Transfer Binder, bound in full canvas, one linen tabbed index.....each, \$3.00
 - 7034 Extra Record Sheets for above, size, $8\frac{3}{4} \times 11$ in., punched for binderper 100, \$2.00
- Full size sample sheet free on application.



Blank Forms

7037	Contracts, between owner and architect..per doz., \$.25	per 100, \$1.75
7039	Building Contracts, short form..... "	.25 " 1.75
7041	Building Contracts, with bond..... "	.25 " 1.75
7043	Contractors' Statements, giving list, etc., of sub-contractors	" .25 " 1.75
7045	Mechanic's Lien Notice..... "	.25 " 1.75
7047	Waiver of Lien..... "	.25 " 1.75

Standard Documents, adopted by the American Institute of Architects and the National Association of Builders:

7048	Complete set in cover.....	\$.15
7048A	Agreement and General Conditions in cover.....	.10
7048B	Bond of Suretyship .....	.02
7048C	Form of Subcontract .....	.02
7048D	Letter of Acceptance of Subcontractor's Proposal.....	.01
7048E	Agreement separate from the General Conditions.....	.02

Specifications

7050	"Standard" Specifications, new and revised form, for frame and brick buildings costing from \$500 to \$15,000. Contains the following headings: General Conditions, Mason, Cut Stone, Plastering, Carpenter, Painter, Glazier, Plumber, Gas Fixtures, Sewers, Galvanized Iron, Structural Iron, Heating (steam or hot water), Heating (hot air), Electric Wiring, Speaking Tubes and Bells..each, \$.25	dozen, \$2.50
7052	Specification Reminder, a handy booklet for writing specifications	each, .50
7053	Printed Covers, for specifications.....per doz., \$.20	per gross, 2.00
7054	Manuscript Covers, for typewritten sheets, Blue, Terra Cotta, Chocolate	per 100, .50
7055	Black Rubber Cloth, for wrapping drawings, tracings, etc., 48 in. wide, per roll of 12 yds.....	\$3.75 per yd., .35

Pasteboard Mailing Tubes (For Metal Tubes, see page 19.)

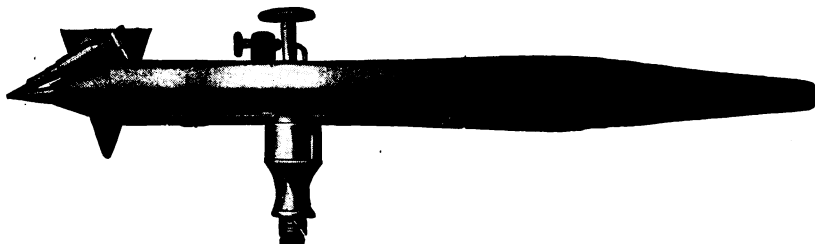
7056	Pasteboard Mailing Tubes: 12 18 24 30 36 42 in. long. 1½ in. diameter.....\$.25 .40 .50 .60 .65 .75 per doz. 2 in. diameter..... .30 .50 .60 .70 .75 .85 "	
7056½	Extra Heavy Pasteboard Tubes, for Mailing Patent Office Drawings: 12½ in. long, 2½ in. diameter. Each..\$.07	per doz..\$.70
7057	Telescoping Pasteboard Tubes, with wooden ends: 3 in. diameter, 38 in. long. Dozen.....\$6.00	each, \$.50
	5 in. diameter, 38 in. long. "	7.20 " .60

Carbon Papers and Typewriter Ribbons

7058	Typewriter Carbon Paper, 8 x 13 in., Purple, Blue or Black, Per 100 sheets.....	\$2.35 per doz. \$.50
7059	Typewriter Ribbons, of any color or for any machine.....	each, 1.25
7065	Stenographer's Note Books, for pencil, ruled in red lines, ½ in. apart: 5 x 9 inches per doz.....\$.75	6 x 9 per dozen. \$.90

Air Brushes—Continued

Made by O. C. Wold.



- 7165 Model C Air Brush**, with interchangeable color cup, which is adjustable, so that the brush can be used on a flat table as well as on an easel, without spilling the colors. In case, with reamer, hanger, metal rubber tube connection, with directions.....\$18.00
- 7167 Model K Air Brush**, operated with the single action movement; fitted with the glass jar and spatterwork adjustment, and a screw threaded needle adjustment for spray and line work. Any color, water or oil, can be used. Will work from a hair line to a broad spray, but the needle has to be adjusted every time a change is made, as it makes the same width of line or spray until the needle is again changed. With glass jar, holding one ounce of color; in case, with directions\$10.00
- 7169 Model J Air Brush**, constructed same as Model K in every detail, but smaller; in case, with directions.....\$8.00
- 7172 Model "Master" Air Brush**. The construction is the same as No. 7160 Model "A-1" Air Brush, only larger. It has a large color cup and will distribute a large volume of color. It is an all around brush for display work and for large or small coloring of any description. It is built with a double action lever motion and will make a hair line to a broad sweep in one movement. The tube cup is adjustable so that the brush can be used in any position. In leather case with tube cup ($\frac{1}{2}$ oz.) with steel reamer, air brush nipple, holder and screws and directions.....\$23.00

Extra Needles....each, \$.25 Reamers...each, \$.25 Air Tips...each, \$1.00

(Continued on next page.)



Fountain Lettering Pen

Made by O. C. Wold.



For rapid and clean-cut lettering and designing of all kinds; easier to handle than the brush and about twice as rapid; furnished with shading pen blades, which make a mark of two shades at a single stroke of the pen, from one color of ink; Pen will not leak in any position.

- 7175 Fountain Lettering Pen**, with one Pen Blade.....each, \$4.00

Separate Pen Blades all interchangeable.

No.	00	0	1	2	3	4	5	6	8
Width	1-32	1-16	$\frac{1}{8}$	3-16	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{7}{8}$ in.
Each	\$.20	.20	.20	.20	.20	.20	.20	.25	.25

- 7177 Automatic Shading Pens.** One Pen, with holder.....each, \$.25

No.	00	0	1	2	3	4	5
Width	1-32	1-16	$\frac{1}{8}$	3-16	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{2}$ in.

- 7180 Faust's Alphabets. Complete Card Writer**, containing lessons and alphabets for use with the Air Brush, Shading Pen, Brush or Marking Pen; 112 pages; size, 6x9; fully illustrated, with over 200 engravings; paper cover.....\$1.25

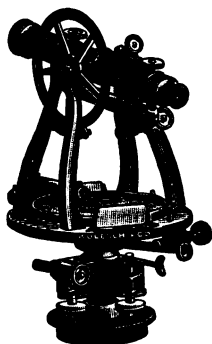


Recommended to artists who use Flake or Chinese white, or Aniline Colors with the Air Brush. Many an artist who found himself ailing without any apparent reason, finally found the cause to be incipient lead poisoning, brought on by inhaling the fine spray of the white and colors used in the air brush. The article illustrated above has a perfect filter device and will keep out fumes, vapors, gases, smoke or dust. Made of soft white rubber, easily cleaned and bends perfectly to fit any face.

- 7185 Cover's Automatic Rubber Respirator**, with directions.....each, \$2.00

KOLESCH & CO., NEW YORK

(Successors to F. Eckel, formerly Blunt & Co.)



The manufacture and sale of High Grade Surveying and Engineering Instruments as conducted by us, was established by Edmund M. Blunt, exact date not obtainable, but who was in business during the war of 1812 and had at that time been in business several years. In 1849 his two sons, Edward Blunt and George W. Blunt, succeeded to the business established by their father.

About 1870 or 1871, two sons of Edward Blunt and an uncle of theirs by name of Nichols took over the plant, under the firm name of Blunt & Nichols.

Later the name was changed to Blunt & Co., then Eckel & Imhoff, and afterwards to F. Eckel, whom many of the engineers of the present day may have met, and during the last 20 years under our management.

Recently, owing to increased business caused by our growing reputation, we have been obliged to increase our facilities and have built a new shop in the suburbs, far from all vibrations and electrical disturbances, which affords the opportunity to do the most delicate adjusting with the greatest possible certainty and precision. This, with the introduction of new and up to date machinery, has made our shop one of the best equipped for precise work in this country. Most of the patterns designed and used by our predecessors have, from time to time, been modified and improved to meet the suggestions and requirements of the Engineering Profession. It has always been our motto: "Quality rather than Quantity." Especial attention has been paid to reducing weight wherever practicable, without affecting the rigidity, durability or stability of the instrument under atmospheric conditions, wind, etc.

We have been particularly successful in producing instruments which will hold their adjustments longer than any others in the market, and we make today "THE BEST INSTRUMENT FOR THE LEAST MONEY; BAR NONE."

The Automatic Dividing Engine, originally built by the Messrs. Blunt during the years 1851-1858, is, with some slight changes in the propelling power, still in use at the present time. As it may interest the Engineering Profession, we give an illustration of same on page 198. This engine is one of the first built in this country and its accuracy has been attested by the late J. E. Hilgard, of the U. S. Coast Survey. Work divided on this engine has stood the most critical tests of Engineers during the many years of its constant use, and the engine ranks to-day as one of the most accurate of its kind.

As no one is admitted to the factory, we have daily messenger service to and from our sales room, which enables us to make very prompt delivery on new work, repairs, etc.

ADDRESS ALL COMMUNICATIONS TO 138 FULTON ST.,
NEW YORK.

For general description of instruments see pages 198-203.
Detailed description of each instrument in its numerical rotation.
For repairs, instruments for rent or exchange, see pages 196-197.

 OUR IRON CLAD GUARANTEE, see page 196.



Purchasers of New Instruments

We make "THE BEST INSTRUMENT FOR THE LEAST MONEY, BAR NONE," and can easily prove this to anyone intending to purchase a transit or level, by sending (on receipt of satisfactory references) one of our make for trial and inspection for one or two weeks, and invite comparison with other makes, none excepted.

This offer we make with the knowledge and assurance, based on our dealings with the Engineering Profession during the past 20 years, that any Engineer or Surveyor is competent to recognize a perfect instrument after he has tried it for a week or two, and are willing to abide by his judgment. From the purchaser's point of view, this must be more satisfactory than trying to analyze selling arguments (written or verbal) of different makers, each claiming his to be the best, but whose product is very often not equal to ours.

On account of the questionable value or merit of printed testimonials we refrain from publishing any of these. We can, however, refer any intending purchaser to actual users of our instruments in his locality, from whom he can obtain unbiased judgment.

Here is the only argument we employ: "Try our instrument for a week or two and judge for yourself." We have the quality of instrument to back this argument, and are willing to abide by your decision.

To those not familiar with the Wearing Quality, Durability, Precision and the manner in which our instruments hold their adjustment, the above trial offer should be convincing that we are willing to trust our customer as much as we expect him to trust us.

Purchasers of new instruments and beginners in the profession, may at times be inclined to take advantage of our liberal offer of extending credit. To parties sending us satisfactory references (see page 197) we will be pleased to make an offer in this sense and solicit correspondence to this effect, also where old instruments are offered in exchange for new ones of our make.

OUR IRON CLAD GUARANTEE.

ANY INSTRUMENT MANUFACTURED BY US, AND SOLD BY US OR THROUGH OUR AGENTS IS ABSOLUTELY GUARANTEED TO BE OF THE BEST MATERIAL AND WORKMANSHIP THAT MONEY CAN PROCURE. ANY INSTRUMENT THAT IS NOT ABSOLUTELY SATISFACTORY AND AS REPRESENTED CAN BE RETURNED AT OUR EXPENSE, AND WE WILL REFUND THE MONEY FOR SAME.

Second-hand Transits or Levels for Sale

Second-hand transits or levels, which we may have on hand, we offer for sale at exceedingly low prices. We of course do not guarantee second-hand instruments, unless they are of our own make, but will deliver the instrument in good adjustment and perfect working order.

The age of a second-hand instrument does not necessarily denote its condition, as we frequently have very old instruments that have not had much use or have been carefully used, and are therefore more desirable than some others of later make or construction, but which have seen hard service or have been abused.

On application, we will furnish detailed descriptions and prices of such second-hand instruments which we may have on hand. To facilitate the sending of these descriptions, please mention whether transit or level is desired and the kind of work contemplated.

Repairs

As it is impossible to give an accurate estimate for repairing a surveying instrument without seeing same, and in the case of complicated repairs, without taking it apart and examining every part carefully, we advise sending instruments for examination. We will, in every case, examine the instrument carefully and give an estimate of the cost of the repairs before going ahead with same.

If the estimate is not satisfactory, or if the owner decides not to have the repair made, instrument will be returned without any charge for examination.

Instruments thus sent, should be boxed and carefully packed and should have the name of the sender on the outside of the packing box. Tripods, unless in need of repairs, need not be sent with the instrument.

During the past 20 years we have had at our shop for repairs, Transits and Levels of all known makers, as well as other makes which are not known to-day, including many foreign makes. During this period we have accumulated patterns of these instruments, which enables us to repair Transits or Levels of any make as cheaply, and in many cases better than the maker.

We are also equipped to make the most complicated repairs within a week or 10 days, and do not make any charge for rush work.

As we realize, that a user of surveying instruments is often temporarily handicapped by the fact that one of his instruments is in the repair shop, we most generally, have a number of second-hand instruments on hand for the purpose of loaning to the customer while we are making his repair. For this we make no charge.

On instruments sent to us for repairs, **Express prepaid**, we pay the return charges.

Instruments for Rent

As we frequently take old instruments in exchange when selling a new one of our make, we most generally have a liberal supply of second-hand Transits and Levels on hand which we can rent to parties requiring them for temporary use.

TERMS: Either a cash deposit covering the value of the instrument rented, or, satisfactory references in writing from three responsible parties, guaranteeing the value and the safe return of the rented instrument.

Should the rentee, after the first month, desire to purchase the rented instrument, or a new one of our make, the full rent paid will be allowed on the purchase price. For the next 5 succeeding months, $\frac{1}{2}$ of the rent paid will be allowed, after which no further allowance will be made.

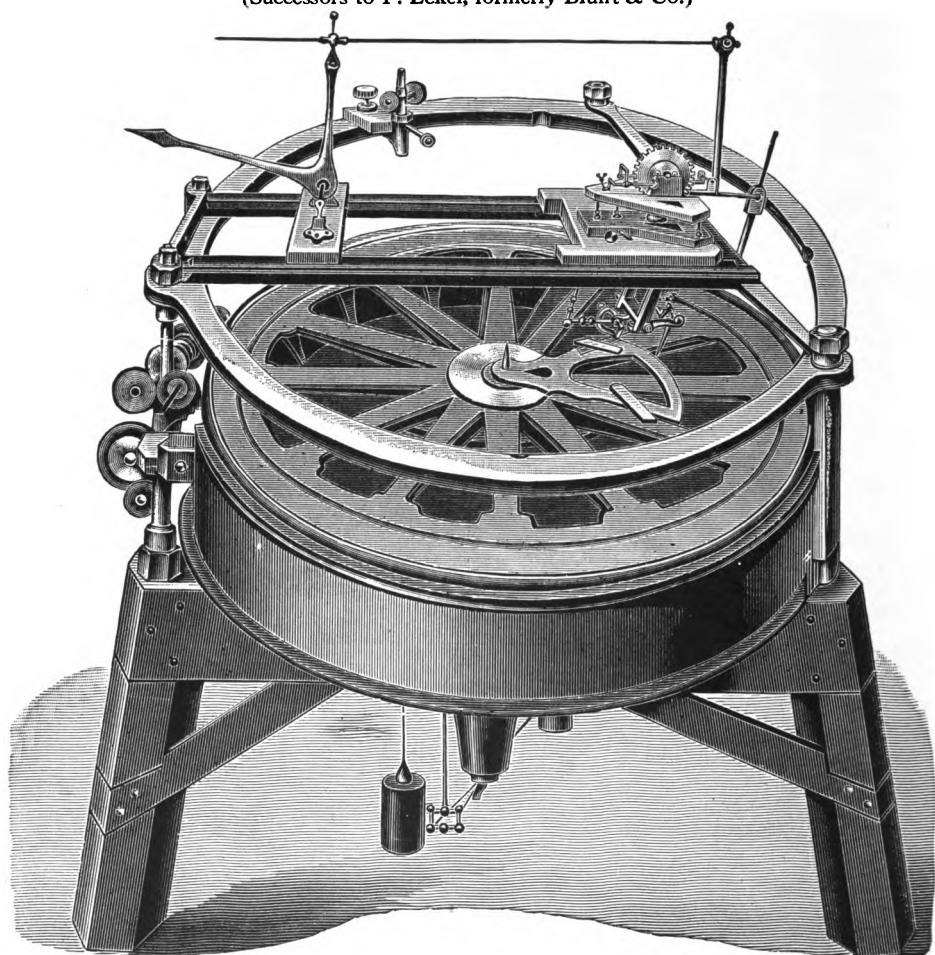
ALL RENT PAYABLE IN ADVANCE each month on the even date on which the instrument is rented.

Charges for Renting Instruments

Rent for second-hand Transit or Level....	per month	\$10.00,	per week,	\$5.00
Same, with leveling rod and sighting pole.	"	13.00	"	\$7.50

KOLESCH & CO., New York.

(Successors to F. Eckel, formerly Blunt & Co.)

**Automatic Dividing Machine.****General Description of Our Transits and Levels.**

The upper and lower plates of our Transits are substantial ribbed castings, and although they weigh about 20 per cent. less than the plates in the old style instruments, they give the instrument a high grade of stiffness and stability. The Standards of our Transits have their legs well spread and set close to the compass box, for the purpose of obtaining the shortest possible axis to telescope and to increase their strength.

Centers. The long compound centers have heavy flanges, and are fitted very accurately into each other; they give the whole instrument an uncommon rigidity and stability. They are made of three different kinds of metal to reduce friction.

Leveling Screws. All our Transits (unless ordered with **three leveling screws**), have a **four-arm piece**, and are provided with a **shifting plate**, sometimes called "shifting center."

The Leveling Centers in our Transits and Levels, which receive the leveling screws, are slotted and can be adjusted by means of the set screws, thus making them uniform under all conditions of wear and temperature. This arrangement dispenses with the dust caps.

The Spirit Levels are extremely sensitive and carefully selected for each instrument.

Clamp and Tangent Screws. The clamps for limbs and centers are all provided with improved micrometer tangent screws, permitting a very fine adjustment of the plates. The screws are made of hard metal, and the clamps are provided with counter springs to take up lost motion.

The Compass in our instruments is graduated to half degrees and marked in quadrants from 0° - 90° , and is provided with a very sensitive bar needle set in a jewel center. The variation plate for correcting the local deviation of the needle is operated by means of a pinion. The shaft of this pinion has a capstan head and is regulated with the adjusting pin.

The Telescope. The best obtainable lenses are used in our telescopes, which are constructed so as to obtain a large flat field with abundant light. The eye-piece, which is adjustable, is provided with a shutter, the objective with cap and sunshade. The object slide is protected by a dust guard, and like the eye-piece, has rack and pinion for focusing. The telescope slides fit snugly and move positively straight, and the line of collimation is correct for all distances. The telescope is well balanced, is reversible from both ends, and has clamp and tangent screw for vertical adjustment. The screws operating the rack and pinion movement of eye-piece and objective are placed on top of the telescope, so as to be accessible for either hand. The magnifying power of our telescopes is about 19-45 diameters. This we have found to be the most serviceable for field and definition.

Graduation. For the purpose of obtaining very sharp and distinct graduations, we divide the horizontal limb as well as the vertical circles or arc on **solid silver**.

The utmost care is given to the correct centering and graduating of the horizontal and vertical circles, and all graduations are warranted to be perfectly accurate.

The vertical arc or circle is divided on **solid silver** and marked from 0° - 90° in quadrants, and usually graduated to 30 minutes reading by vernier to single minutes; but can be graduated to correspond with the divisions of the horizontal limb if desired.

The horizontal limb is numbered as follows: One row 0° - 360° and the other 360° - 0° running in opposite directions, the slant of the figures denoting the latter (see page 200). Has two opposite verniers marked A and B, which are placed at about 30 degrees to the telescope, and are protected by glass covers. Ground glass shades attached to the verniers of all transits Nos. 7500 to 7673.

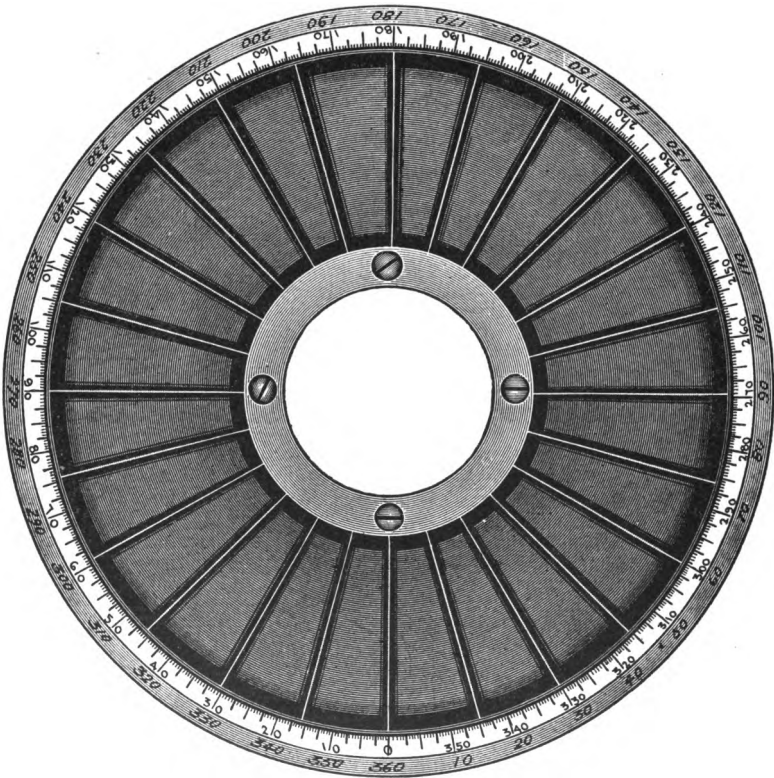
The verniers of **Solid Silver** on our stock transits Nos. 7500-7673 read to 30 seconds (see cut, page 201). Other divisions to order at short notice.



The **Cross and Stadia Hairs** in our telescopes are of the best web, uniform in thickness, and are reliable under all atmospheric conditions. All **Stadia Hairs** are set to read on a leveling rod exactly one foot for a distance of 100 feet, but are adjustable for any other distance.

Gradianer Attachments will be furnished with our instruments whenever required. The **Gradianer** is a special tangent screw attached to the clamp of the telescope axis; it is divided into 50 parts, one complete revolution of the screw corresponding to one foot in fifty feet distance; fractions of one foot being easily read by the division of the screw.

We use **Cloth Finish** on all our instruments. Other finish to order.



Style A—The above cut represents the lower plate with the divisions and numbering used on all of our stock transits. Numbered in two rows from 0° - 360° and from 360° - 0° , the slant of the figures denoting the direction. Inner row of figures is placed on **Solid Silver**, and the outer row on the adjacent phosphor bronze of the limb plate. This arrangement makes it almost impossible to make an error in reading.

Can furnish to order any of the following styles of divisions:

Style B—Lower limb plate numbered on inner row 0° - 180° and back 180° - 0° . Outer row from 190° - 360° .

Style C—Inner row in quadrants 0° - 90° - 0° right and left from 0. Outer row, 0° - 360° .

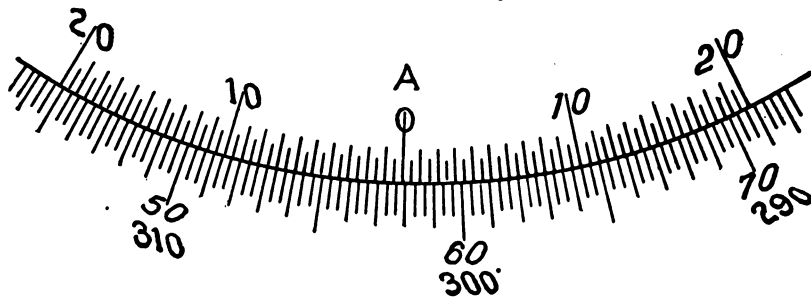
Verniers

The following types of verniers are the ones most generally used, and as they are fully illustrated need not be described in detail. Of those we use

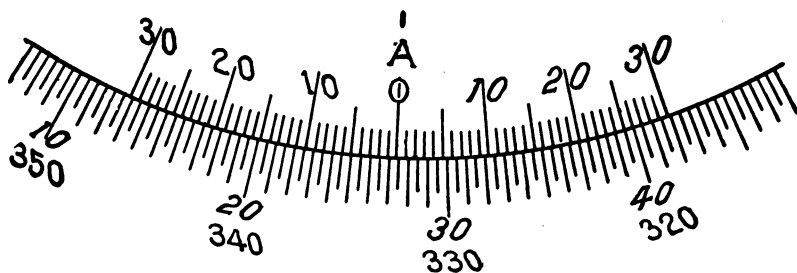
30 seconds verniers on our Transits Nos. 7500-7673

60 seconds verniers on our Transits Nos. 7700-7722

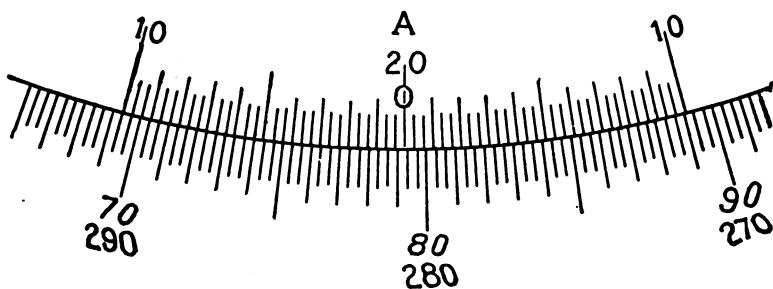
20 seconds verniers to order only



Limb plate divided to 20 minutes, verniers reading to 30 seconds.



Limb plate divided to 30 minutes, verniers reading to 60 seconds.



Limb plate divided to 20 minutes, verniers reading to 20 seconds.

OUR IRON CLAD GUARANTEE, see page 196.



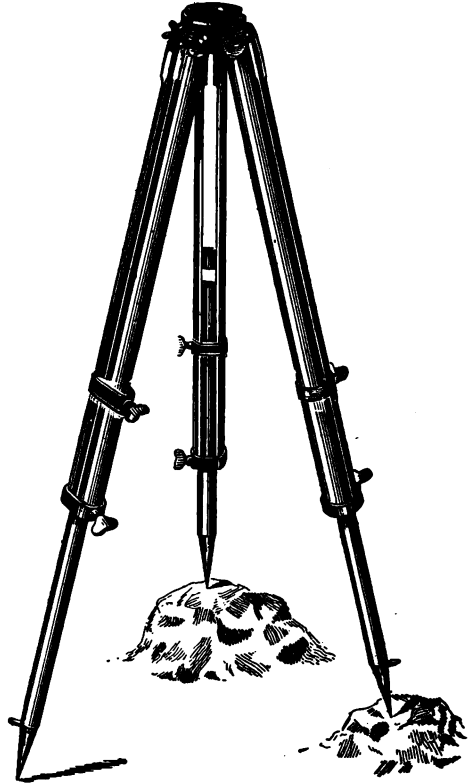
Tripods and Cases

The head of the Tripod is cast in one piece, has a strong screw-thread for mounting the instrument, and is provided with a screw cap to protect the thread from injury while being transported. With each transit or level Nos. 7500-7831 we furnish a split leg tripod as illustrated below. With levels Nos. 7850-7890 we furnish a solid leg tripod. All tripods with Hip Shoes as per illustration.

Strong, neatly-fitting carrying cases with lock, key and leather strap are furnished with each instrument; also plumb bob, adjusting pins and magnifying glass. To protect the instrument from jarring, the bottom of the case is provided with rubber cushions.



Split Leg Tripod



Extension Tripod

- Tripods for Transit and Levels Nos. 7500-7673 and 7800-7831.
- | | | |
|------|--|-------------|
| 7400 | Split Leg Tripod, weight 9½ lbs., without instrument....each, | \$10.00 |
| 7405 | Extension Tripod, weight 11 lbs., without instrument....each, | 15.00 |
| | Same, with instrument instead of regular tripod.....each, | 5.00 |
| 7406 | Combination Tripod, two split legs and one extension leg, without instrument | each, 11.25 |
| | Same, with instrument instead of regular tripod.....each, | 1.25 |

The Combination Tripod is a very popular style of tripod, the one extension leg making it very handy when setting up instrument at the side of a hill or over a high curb.

Tripods—Continued

Light Tripods for Transits Nos. 7680-7722.

7410	Split Leg Tripod, weight 8 lbs.....	each, \$10.00
7415	Extension Tripod, weight 7½ lbs.....	“ 12.00
	Same with instrument, instead of regular tripod.....	“ 6.00
7416	Combination Tripod, split leg tripod with one extension leg, “	7.25
	Same with instrument, instead of regular tripod.....	“ 1.25

Light Tripods for Levels Nos. 7850-7890.

7420	Solid Leg Tripod, weight 8 lbs.....	“ 6.00
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Tripod Pad



Tripod Pad, consists of a Sheet Iron Plate enclosed between a Leather Covering on top, and a heavy Felt Pad on the bottom; heavily stitched together and so shaped as to fit the shoulder snugly.

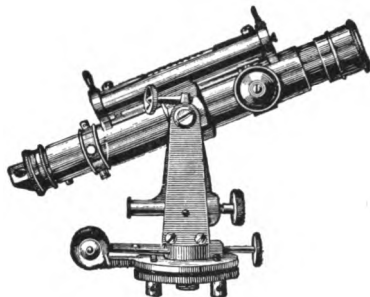
Two short straps and one long strap are riveted stoutly to the plate inside, and so placed as to make the surveying instrument ride evenly on the pad. The two short straps are used to fasten the pad on the tripod, and the long strap is used to fasten the three tripod legs together. When using the surveying instrument, it is not necessary to remove the pad from the tripod. This useful article will be appreciated by all who have done any “hiking” with a surveying instrument.

7425	Tripod Pad, as described above.....	each, \$2.00
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Tripod Thermometer

7430	Tripod Thermometer, suitable for attaching to the tripod of a surveying instrument.....	each, 2.00
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Repair Parts, Extras, and Attachments to Transits and Levels



Solar Attachment, if ordered with new instrument.....\$50.00

(This solar attachment, attached to any transit with bubble and vertical circle, serves to obtain the meridian, latitude and time, with great accuracy, and can be used also as a vertical sighting telescope.)

Bone Oil, best quality, for surveying instruments.....per bottle, \$.25

Brass Bolt, with Wing Nut, for Tripods Nos. 7400-7406.....each, 1.25

Brass Bolt with Wing Nut, for Tripods Nos. 7410-7420..... " 1.00

Cap for eye-piece..... " .75

Cap for objective..... " .50

Cap with brass plate, for Tripods Nos. 7400-7406..... " .75

Cap, wooden, for Tripods Nos. 7410-7420..... " .40

Center Key for Transits and Levels..... .10

Clamp Screw for upper or lower plate of Transits..... " .75

Compass Needle and Center Pin..... " 3.00

Colored Glass, dark, for eye-piece..... " 2.00

Cover Glass for compass, with ground edge..... " .75

Cover Glass for Verniers, ground edge..... " .75

Cross Hairs with Diaphragm..... " 2.00

Cross Hairs with Diaphragm, inserted in old instrument and adjusted, 5.00

Cross Hairs attached to old Diaphragm..... 1.75

Cross Hairs attached to old Diaphragm and adjusted in old instrument, 4.75

Cups for Leveling Screws, per set of four, \$.50.....each, .15

Disappearing Stadia Hairs, if ordered with new instrument..... 5.00

Disappearing Stadia Hairs, inserted and adjusted in old instrument.... 8.00

Extra Telescope, for vertical sighting, with prism to eye-piece, either on top or at side of regular telescope, when ordered with new instrument 40.00

Extra Telescope at right angles to regular telescope, when ordered with new instrument..... 55.00

Eye-piece with reflecting prism to attach to regular eye-piece..... 5.00

Fixed Stadia Hairs, if ordered with new instrument..... 3.00

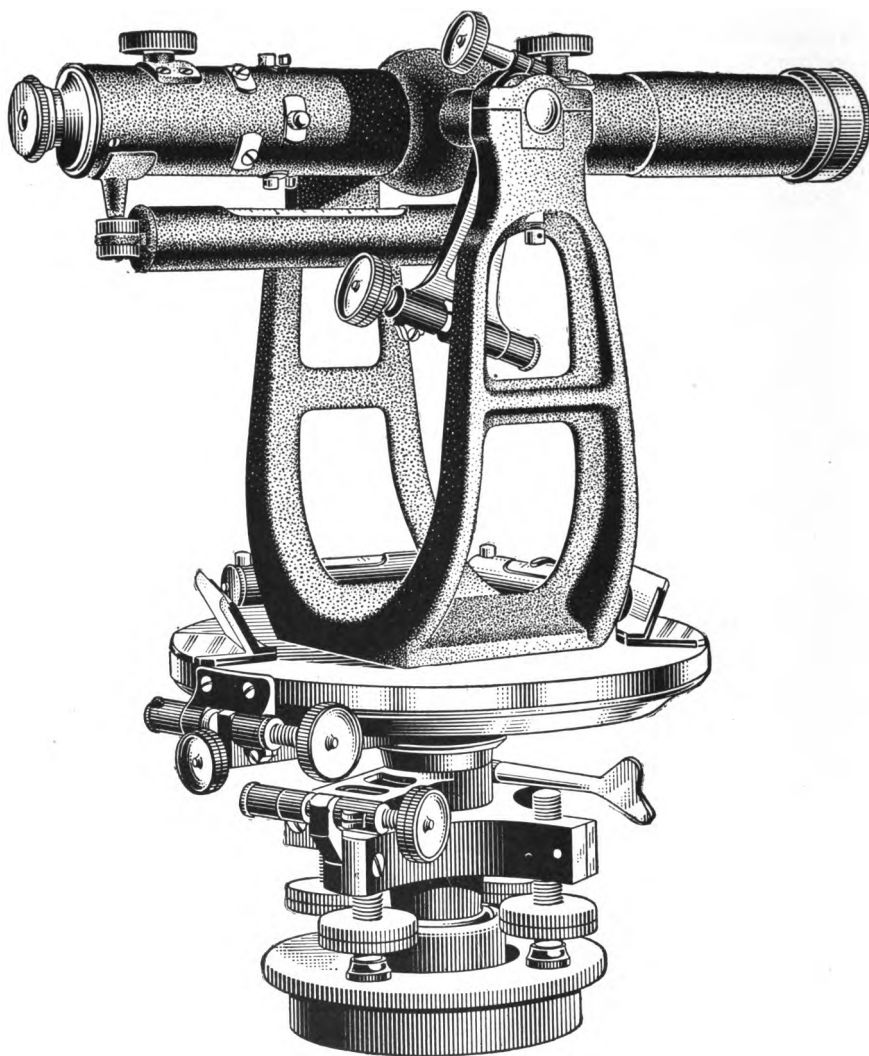
Fixed Stadia Hairs, inserted and adjusted in old instrument..... 6.00

Folding Sights attached to telescope.....per pair, 8.00

Folding Sights to Standards at right angles to telescope..... " 10.00

Repair Parts, Extras and Attachments—Continued

Gossamer Bags, for Transits or Levels, of rubber cloth	each, \$	1.00
Gossamer Bags, for Transits or Levels, of rubber silk	"	2.00
Gradienter Screw, instead of Tangent Screw (see cut 7640)....	"	5.00
Gradienter Screw, attached to old instrument.....	"	10.00
Graduating Limb Plate and Verniers to 30 seconds.....	"	10.00
Graduating Limb Plate and Verniers to 20 seconds.....	"	15.00
Graduating Limb Plate and Verniers to 10 seconds.....	"	20.00
Graduating Vertical Circle and Vernier to 30 seconds.....	"	10.00
Graduating Vertical Circle and Vernier to 20 seconds.....	"	15.00
Graduating Vertical Circle and Vernier to 10 seconds.....	"	20.00
	Mtd. Unmtd.	
Ground Glass Level Vials, for telescopes of Y Levels.....	\$5.00	\$4.00
Ground Glass Level Vials, for telescopes of Transits.....	4.50	3.50
Ground Glass Level Vials, for plates of Transits.....	2.50	1.25
Ground Glass Level Vials, for telescopes for Nos. 7700-7722..	4.00	3.00
Ground Glass Level Vials, for plates for Nos. 7700-7722.....	2.00	1.00
Ground Glass Shades attached to Verniers, with Frames.....		5.00
Ground Glass Shades attached to Verniers, without Frames.....		3.00
Guard to Vertical Circle.....	each,	5.00
Improved Sun Shade, with Reflector.....	"	4.00
Inverting or Astronomical Eye-piece.....	"	10.00
Legs for Tripods No. 7400, each, \$2.25; with brass bolt and nut....		3.50
Legs for Tripods No. 7405, " 3.50; with brass bolt and nut....		4.75
Legs for Tripods No. 7410, " 2.25; with brass bolt and nut....		3.25
Legs for Tripods No. 7415, " 3.50; with brass bolt and nut....		4.50
Legs for Tripods No. 7420, " 1.25; with brass bolt and nut....		2.25
Leveling Screws, for Levels and Transits, large.....	each,	1.50
Leveling Screws, for Levels and Transits, small.....	"	1.00
Magnifying Glasses, attached to Transits.....	"	5.00
Object Glass, for Levels and Transits, large.....	"	10.00
Object Glass, for Levels and Transits, small.....	"	6.00
Phosphor-bronze (non-magnetic) Adjusting Pins, for variation plate	"	.05
Reversible Bubble, for Transits.....	"	15.00
Right Angle Sights, attached to standards of Transits.....	per pair,	5.00
Shoes for Tripods Nos. 7400-7406.....	each,	.50
Shoes for Tripods Nos. 7410-7420.....	"	.40
Steel Adjusting Pins, per dozen, \$.50.....	"	.05
Sun Shades, for Transits and Levels.....	"	.75
Tangent Screws, for Transits or Levels.....	"	.75
Telescope, with Theodolite Axis.....	"	10.00
Tripod Head, with bolts and wing nuts, for Nos. 7400-7406....	"	5.00
Tripod Head, with bolts and wing nuts, for Nos. 7410-7420....	"	3.00
Trivet for Levels Nos. 7850-7890.....	"	1.00
Vertical Circle, with 2 opposite Verniers and Guard, in place of regular Vertical Circle.....	"	30.00
Vertical Circle and 1 Vernier, graduated on outside edge instead of flat face, with guard in place of regular vertical circle....	"	15.00



7500 "Metropolitan" Transit. (For description see Page 207.)

Kolesch "Metropolitan" Transit, No. 7500

7500 "Metropolitan" Transit. Cloth Finish. U Shape Standards attached to the flange of the inner center. Very rigid and durable construction. With powerful achromatic terrestrial telescope about 12 inches long. Magnifying power 26 diameters. Will focus 5 or 6 feet from the instrument, which point will be appreciated when using a small offset. Lenses are especially made and selected by the best European optical works. Aperture of object glass $1\frac{1}{4}$ in. Dust Cap and Sun Shade. Improved rack and pinion movement to eye-piece and objective. Fine bubble ($4\frac{1}{4}$ in. vial) of **25 seconds** sensitiveness, graduated on the glass, attached to the extreme end of telescope. This position of the bubble insures greater accuracy in leveling and makes it visible in its entire length from either side. Telescope reversible from both ends. Center point in top of telescope axis for the purpose of setting under suspended plumb bob in shaft or tunnel work.

Cross and Stadia Hairs. Disappearing. Set in two diaphragms, so that either the cross or stadia hairs can be brought into focus as desired. Stadia hairs are adjusted to read one foot on a rod 100 feet from the instrument. Constant supplied with each transit.

Shifting Centers. The centers are extra long and made of three different kinds of metal to reduce friction.

The Four Leveling Arms are slotted and can be adjusted by means of the set screws.

Screws. All tangent and leveling screws are made of German Silver. Clamp and tangent screws of improved construction, with counterspring. Clamp screw to lower plate is flat and placed directly in back of the tangent screw which is round (see cut). This enables the engineer to readily distinguish which screw he is using.

Bubbles. Two finely graduated bubbles of **20 seconds** sensitiveness, at right angles to each other, attached to the extreme edge of the limb plate, which position insures greater accuracy in leveling.

Horizontal Limb, 6 inches, graduated on **Solid Silver** to 20 minutes, and numbered from 0° - 360° in two rows running in opposite directions, the slant of the figures denoting the direction.

Verniers. Two opposite verniers (at 30° deg. to the telescope) reading to 30 seconds (see page 201). Ground glass shades attached to both verniers.

Weight of instrument without tripod, about $14\frac{1}{2}$ lbs.

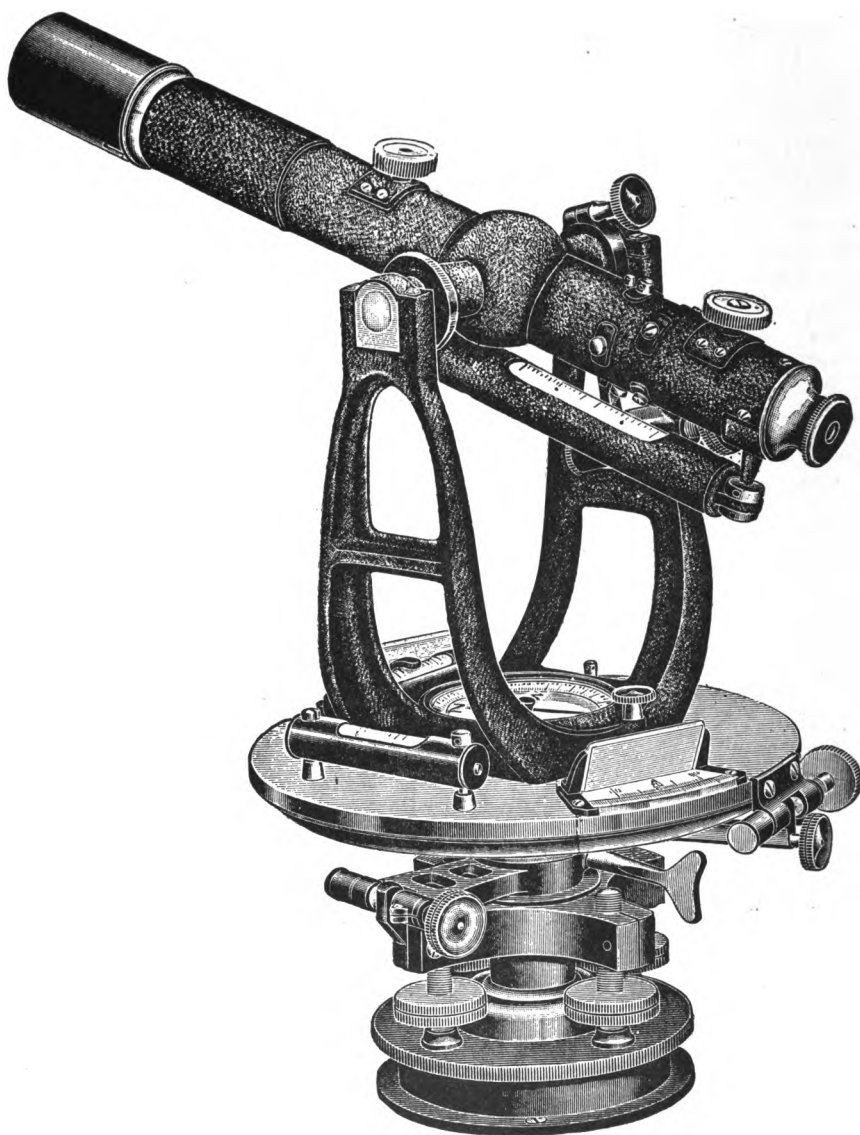
Instrument complete, in finely polished box, with plumb bob, reading glass, center key, adjusting pins, gossamer bag and tripod

No. 7400	each, \$195.00
7502 Same as No. 7500, but with horizontal limb plate $6\frac{1}{2}$ in.,	
	each, 200.00

Optional Additions to Either of Above Transits, To Order Only.

20 seconds verniers, instead of 30 seconds.....	\$10.00
Astronomical (inverting) eye-piece instead of erecting.....	10.00
Three leveling arms instead of four arms.....	15.00
Magnifying glasses attached to verniers on limb plate.....	10.00
Vertical Arc, 5 in., attached to Nos. 7500 or 7502.....	15.00
Vertical Circle, 5 in., attached to Nos. 7500 or 7502.....	20.00

 OUR IRON CLAD GUARANTEE, see page 196.



7505 "Metropolitan" Transit, with Compass.

(For description see page 209.)

Kolesch "Metropolitan" Transit No. 7505

7505 "Metropolitan" Transit. Cloth Finish. U Shape Standards attached to the flange of the inner center. Very Rigid and Durable Construction. With powerful achromatic terrestrial telescope about 12 inches long. Magnifying power 26 diameters. Will focus 5 or 6 feet from the instrument, which point will be appreciated when using a small offset. Lenses are especially made and selected by the best European optical works. Aperture of object glass $1\frac{1}{4}$ in. Dust Cap and Sun Shade. Improved rack and pinion movement to eye-piece and objective. Fine bubble ($4\frac{1}{4}$ in. vial) of **25 seconds** sensitiveness, graduated on the glass, attached to the extreme end of telescope. This position of the bubble insures greater accuracy in leveling and makes it visible in its entire length from either side. Telescope reversible from both ends. Center point in top of telescope axis for the purpose of setting under suspended plumb bob in shaft or tunnel work.

Cross and Stadia Hairs. Disappearing. Set in two diaphragms, so that either the cross or stadia hairs can be brought into focus as desired. Stadia hairs are adjusted to read one foot on a rod 100 feet from the instrument. Constant supplied with each transit.

Shifting Centers. The centers are extra long and made of three different kinds of metal to reduce friction.

The Four Leveling Arms are slotted and can be adjusted by means of the set screws.

Screws. All tangent and leveling screws are made of German Silver. Clamp and tangent screws of improved construction, with counterspring. Clamp screw to lower plate is flat and placed directly in back of the tangent screw which is round (see cut). This enables the engineer to readily distinguish which screw he is using.

Horizontal Limb, 6 inches, graduated on **Solid Silver** to 20 minutes, and numbered from 0° - 360° in two rows running in opposite directions, the slant of the figures denoting the direction.

Bubbles. Two finely graduated bubbles of **20 seconds** sensitiveness, at right angles to each other, attached to the extreme edge of the limb plate, which position insures greater accuracy in leveling.

Verniers. Two opposite verniers (at 30° deg. to the telescope) reading to 30 seconds, see page 201. Ground glass shades attached to both verniers.

Compass, divided on **Solid Silver** to half degrees, with improved bar needle $2\frac{1}{4}$ in. With variation plate and capstan head for setting same.

Weight of instrument without tripod, about 15 lbs.

Instrument complete, in finely polished box, with plumb bob, reading glass, center key, adjusting pins, gossamer bag and tripod
No. 7400each, \$210.00

7507 Same as No. 7505, but with horizontal limb plate $6\frac{1}{2}$ in., each, 215.00

Optional Additions to Either of Above Transits, To Order Only.

20 seconds verniers, instead of 30 seconds.....	\$10.00
Astronomical (inverting) eye-piece instead of erecting.....	10.00
Three leveling arms instead of four arms.....	15.00
Magnifying glasses attached to verniers on limb plate.....	10.00
Vertical Arc, 5 in., attached to Nos. 7505 or 7507.....	15.00
Vertical Circle, 5 in., attached to Nos. 7505 or 7507.....	20.00

 **OUR IRON CLAD GUARANTEE,** see page 196.



7510 "Metropolitan" Transit, with Compass and Vertical Circle.

(For description see Page 211.)

Kolesch "Metropolitan" Transit No. 7510

7510 "Metropolitan" Transit. Cloth Finish. U Shape Standards attached to the flange of the inner center. Very Rigid and Durable Construction. With powerful achromatic terrestrial telescope about 12 inches long. Magnifying power 26 diameters. Will focus 5 or 6 feet from the instrument, which point will be appreciated when using a small offset. Lenses are especially made and selected by the best European optical works. Aperture of object glass $1\frac{1}{4}$ in. Dust Cap and Sun Shade. Improved rack and pinion movement to eye-piece and objective. Fine bubble ($4\frac{1}{4}$ in. vial) of **25 seconds** sensitiveness, graduated on the glass, attached to the extreme end of telescope. This position of the bubble insures greater accuracy in leveling and makes it visible in its entire length from either side. Telescope reversible from both ends. Center point in top of telescope axis for the purpose of setting under suspended plumb bob in shaft or tunnel work.

Cross and Stadia Hairs. Disappearing. Set in two diaphragms, so that either the cross or stadia hairs can be brought into focus as desired. Stadia hairs are adjusted to read one foot on a rod 100 feet from the instrument. Constant supplied with each transit.

Shifting Centers. The centers are extra long and made of three different kinds of metal to reduce friction.

The Four Leveling Arms are slotted and can be adjusted by means of the set screws.

Screws. All tangent and leveling screws are made of German Silver. Clamp and tangent screws of improved construction, with counter spring. Clamp screw to lower plate is flat and placed directly in back of the tangent screw which is round (see cut). This enables the engineer to readily distinguish which screw he is using.

Bubbles. Two finely graduated bubbles of **20 seconds** sensitiveness, at right angles to each other, attached to the extreme edge of the limb plate, which position insures greater accuracy in leveling.

Horizontal Limb, 6 inches, graduated on **Solid Silver** to **20 minutes**, and numbered from 0° - 360° in two rows running in opposite directions, the slant of the figures denoting the direction.

Verniers. Two opposite verniers (at 30 deg. to the telescope) reading to 30 seconds (see page 201). Ground glass shades attached to both verniers.

Compass, divided on **Solid Silver** to half degrees, with improved bar needle $2\frac{1}{4}$ in. With variation plate and capstan head for setting same.

Vertical Circle, 5 inches, graduated on **Solid Silver** to 30 minutes, with vernier reading to 60 seconds.

Weight of instrument without tripod, about 15 lbs.

Instrument complete, in finely polished box, with plumb bob, reading glass, center key, adjusting pins, gossamer bag and tripod No. 7400.....each, \$230.00

7512 Same as No. 7510, but with horizontal limb plate $6\frac{1}{2}$ in., each, 235.00

Optional Additions to Either of Above Transits, To Order Only.

20 seconds verniers, instead of 30 seconds.....	\$10.00
Astronomical (inverting) eye-piece instead of erecting.....	10.00
Three leveling arms instead of four arms.....	15.00
Magnifying glasses attached to verniers on limb plate.....	10.00
Vertical Arc, 5 in., instead of Vertical Circle.....	deduct 5.00

 **OUR IRON CLAD GUARANTEE,** see page 196.



7540 "Metropolitan Junior" Transit, with Compass.

(For description see page 213.)

Kolesch "Metropolitan Junior" Transit No. 7540

7540 "Metropolitan Junior" Transit. U Shape Standards attached to the flange of the inner center. Very rigid and durable construction. With powerful achromatic terrestrial (erecting) telescope about 8½ inches long. Magnifying power, 20 diameters. Will focus 5 or 6 feet from the instrument, which is very convenient on short offsets. Lenses are especially made and selected by the best European optical works. Aperture of object glass, 1 inch. Dust cap and sun shade. Improved rack and pinion movement to eye-piece and objective. Fine bubble (4 inch vial) of **25 seconds** sensitiveness, graduated on the glass, attached to the extreme end of telescope. This position of the bubble insures greater accuracy in leveling and makes it visible in its entire length from either side. Telescope reversible from both ends. Center point in top of telescope axis for the purpose of setting under suspended plumb bob in shaft or tunnel work.

Cross and Stadia Hairs are disappearing, so that either can be brought into focus as desired. Stadia hairs are adjusted to read one foot on a rod 100 feet from the instrument. Constant supplied with each transit.

Shifting Centers. The Centers are extra long and made of three different kinds of metal to reduce friction.

The Four Leveling Arms are slotted, and can be adjusted by means of the set screws.

Screws. All tangent and leveling screws are made of **German Silver**. Clamp and tangent screws of improved construction with counter spring. Clamp screw to lower plate is flat and located directly behind the tangent screw, which is round (see cut). This position makes them easily accessible to the hand, and enables the engineer to readily distinguish which screw he is using.

Bubbles. Two finely graduated bubbles of **20 seconds** sensitiveness, at right angles to each other, attached to the extreme edge of the limb plate, which position insures greater accuracy in leveling.

Horizontal Limb, 5 inches, graduated on **Solid Silver** to 20 minutes, and numbered from 0°-360° in two rows running in opposite directions, the slant of the figures denoting the direction.

Verniers. Two opposite verniers at 30 degrees to the telescope, reading to 30 seconds (see page 201). Ground glass shades attached to both verniers.

Compass, divided on **Solid Silver** to half-degrees, with improved bar needle, 2 inch. With variation plate and capstan head for setting same.

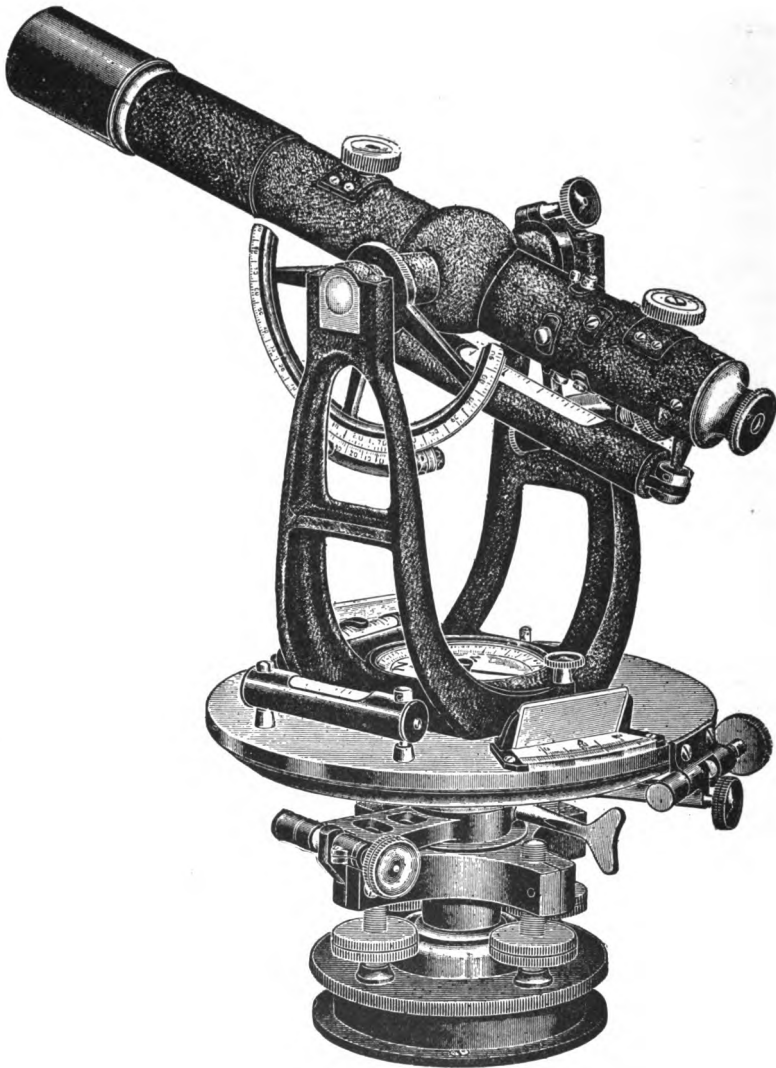
Weight of instrument without tripod, about 9 lbs.

Instrument, complete, in finely polished box, with plumb bob, reading glass, center key, adjusting pins, gossamer bag and tripod
No. 7400each, \$200.00

Optional Additions to Above Transit, To Order Only.

20 seconds verniers, instead of 30 seconds.....	\$10.00
Astronomical (inverting) eye-piece, instead of erecting.....	10.00
Three leveling arms, instead of four arms.....	15.00
Magnifying glasses attached to verniers on limb plate.....	10.00
60 seconds verniers, at same price as No. 7540.	

 OUR IRON CLAD GUARANTEE, see page 196.



7550 "Metropolitan Junior" Transit, with Compass and Vertical Arc.

(For description see Page 215.)

Kolesch "Metropolitan Junior" Transit No. 7550

7550 "Metropolitan Junior" Transit. U Shape Standards attached to the flange of the inner center. Very rigid and durable construction. With powerful achromatic terrestrial (erecting) telescope, about $8\frac{1}{2}$ inches long. Magnifying power, 20 diameters. Will focus 5 or 6 feet from the instrument, which is very convenient on short offsets. Lenses are especially made and selected by the best European optical works. Aperture of object glass, 1 inch. Dust Cap and Sun Shade. Improved rack and pinion movement to eye-piece and objective. Fine bubble (4 inch vial) of 25 seconds sensitiveness, graduated on the glass, attached to the extreme end of telescope. This position of the bubble insures greater accuracy in leveling and makes it visible in its entire length from either side. Telescope reversible from both ends. Center point in top of telescope axis for the purpose of setting under suspended plumb bob in shaft or tunnel work.

Cross and Stadia Hairs are disappearing, so that either can be brought into focus as desired. Stadia hairs are adjusted to read one foot on a rod 100 feet from the instrument. Constant supplied with each transit.

Shifting Centers. The centers are extra long and made of three different kinds of metal to reduce friction.

The Four Leveling Arms are slotted and can be adjusted by means of the set screws.

Screws. All tangent and leveling screws are made of German Silver. Clamp and tangent screws of improved construction, with counterspring. Clamp screw to lower plate is flat and located directly behind the tangent screw, which is round (see cut). This position makes them easily accessible to the hand, and enables the engineer to readily distinguish which screw he is using.

Bubbles. Two finely graduated bubbles of 20 seconds sensitiveness, at right angles to each other, attached to the extreme edge of the limb plate, which position insures greater accuracy in leveling.

Horizontal Limb, 5 inches, graduated on Solid Silver to 20 minutes, and numbered from 0° - 360° in two rows running in opposite directions, the slant of the figures denoting the direction.

Verniers. Two opposite verniers at 30 degrees to the telescope, reading to 30 seconds (see page 201). Ground glass shades attached to both verniers.

Compass, divided on Solid Silver to half-degrees, with improved bar needle, 2 inch. With variation plate and capstan head for setting same.


Vertical Arc, 4 inches, graduated on Solid Silver to 30 minutes, with vernier reading to 60 seconds.

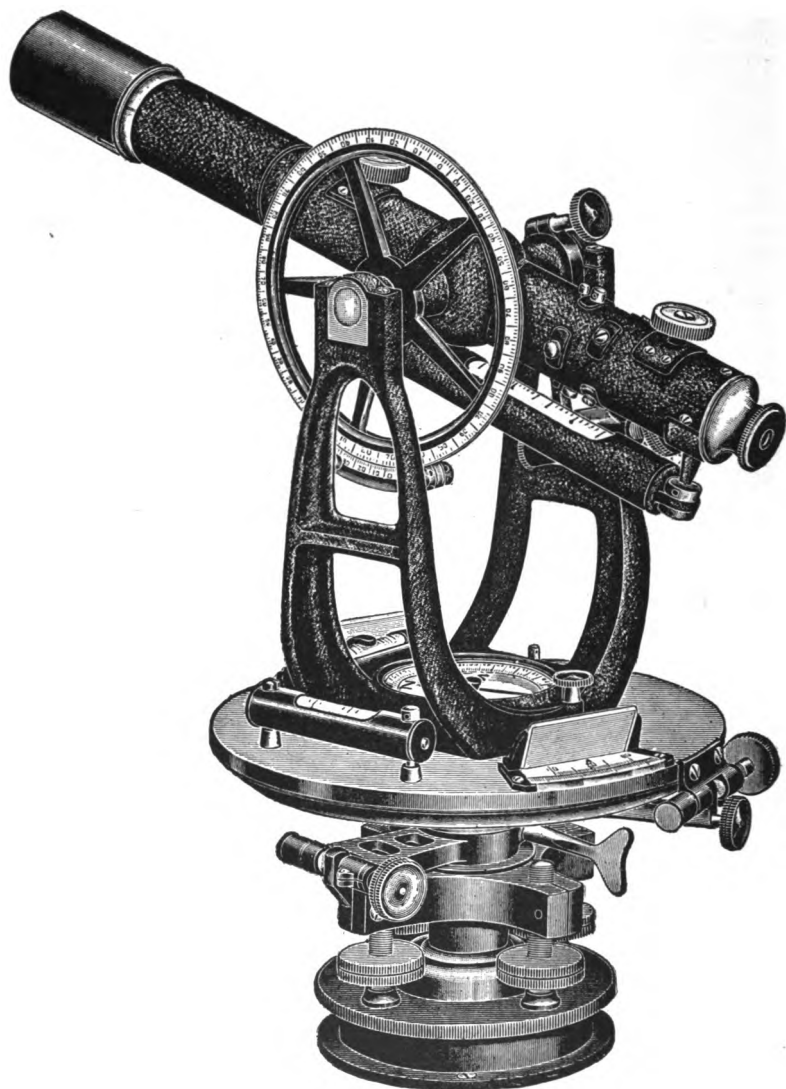
Weight of instrument without tripod, about $9\frac{1}{2}$ lbs.

Instrument complete, in finely polished box, with plumb bob, reading glass, center key, adjusting pins, gossamer bag and tripod
No. 7400each, \$215.00

Optional Additions to Above Transit, To Order Only.

20 seconds verniers, instead of 30 seconds.....	\$10.00
Astronomical (inverting) eye-piece, instead of erecting.....	10.00
Three leveling arms, instead of four arms.....	15.00
Magnifying glasses attached to verniers on limb plate.....	10.00
60 seconds verniers at same price as No. 7550.....	10.00

 OUR IRON CLAD GUARANTEE, see page 196.



7560 "Metropolitan Junior" Transit, with Compass and Vertical Circle.

(For description see page 217.)



Kolesch "Metropolitan Junior" Transit No. 7560

7560 "Metropolitan Junior" Transit. U Shape Standards attached to the flange of the inner center. Very rigid and durable construction. With powerful achromatic terrestrial (erecting) telescope, about $8\frac{1}{2}$ inches long. Magnifying power, 20 diameters. Will focus 5 or 6 feet from the instrument, which is very convenient on short offsets. Lenses are especially made and selected by the best European optical works. Aperture of object glass, 1 inch. Dust cap and sun shade. Improved rack and pinion movement to eye-piece and objective. Fine bubble (4 inch vial) of 25 seconds sensitiveness, graduated on the glass, attached to the extreme end of telescope. This position of the bubble insures greater accuracy in leveling and makes it visible in its entire length from either side. Telescope reversible from both ends. Center point in top of telescope axis for the purpose of setting under suspended plumb bob in shaft or tunnel work.

Cross and Stadia Hairs are disappearing, so that either can be brought into focus as desired. Stadia hairs are adjusted to read one foot on a rod 100 feet from the instrument. Constant supplied with each transit.

Shifting Centers. The centers are extra long and made of three different kinds of metal to reduce friction.

The Four Leveling Arms are slotted and can be adjusted by means of the set screws.

Screws. All tangent and leveling screws are made of German Silver. Clamp and tangent screws of improved construction, with counterspring. Clamp screw to lower plate is flat and located directly behind the tangent screw, which is round (see cut). This position makes them easily accessible to the hand, and enables the engineer to readily distinguish which screw he is using.

Bubbles. Two finely graduated bubbles of 20 seconds sensitiveness, at right angles to each other, attached to the extreme edge of the limb plate, which position insures greater accuracy in leveling.

Horizontal Limb, 5 inches, graduated on solid silver to 20 minutes, and numbered from 0° - 360° in two rows running in opposite directions, the slant of the figures denoting the direction.

Verniers. Two opposite verniers at 30 degrees to the telescope, reading to 30 seconds (see page 201). Ground glass shades attached to both verniers.

Compass, divided on solid silver to half-degrees, with improved bar needle, 2 inch. With variation plate and capstan head for setting same.

Vertical Circle, 4 inches, graduated on solid silver to 30 minutes, with vernier reading to 60 seconds.

Weight of instrument without tripod, about $9\frac{1}{2}$ lbs.

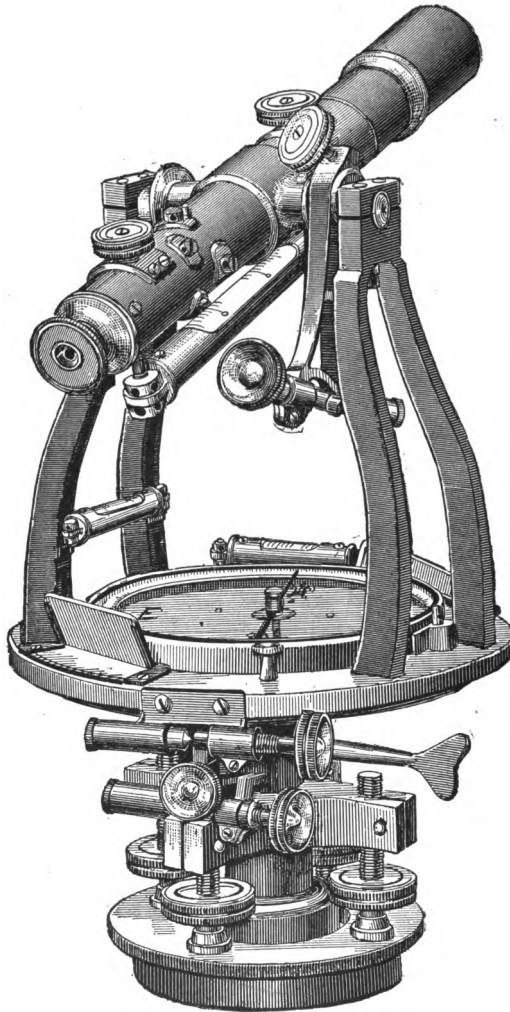
Instrument complete, in finely polished box, with plumb bob, reading glass, center key, adjusting pins, gossamer bag and tripod
No. 7400each, \$220.00

Optional Additions to Above Transit, To Order Only.

20 seconds verniers, instead of 30 seconds.....	\$10.00
Astronomical (inverting) eye-piece, instead of erecting.....	10.00
Three leveling arms, instead of four arms.....	15.00
Magnifying glasses, attached to verniers on limb plate.....	10.00
60 seconds verniers at same price as No. 7560.	

OUR IRON CLAD GUARANTEE, see page 196.

"Extra Fine Quality" Transit



7600 "Extra Fine Quality" Transit.

(For description see page 219.)

Kolesch Transit No. 7600

Extra Fine Quality.

7600 "Extra Fine Quality" Transit, for high-grade work requiring extreme accuracy and precision. **Bent Standards.** With powerful achromatic terrestrial (erecting) telescope about 11 inches long. Magnifying power 24 diameters. Will focus 5 or 6 feet from the instrument, which is very convenient on short offsets. Lenses are especially made and selected by the best European optical works. Aperture of object glass $1\frac{3}{16}$ inches. Dust Cap and Sun Shade. Improved rack and pinion movement to eye-piece and objective. Fine bubble ($\frac{4}{4}$ in. vial) of 30 seconds sensitiveness, graduated on the glass and attached to the extreme end of telescope. This position of the bubble insures greater accuracy in leveling and makes it visible in its entire length from either side. Telescope reversible from both ends. Center point in top of telescope axis for the purpose of setting under suspended plumb bob in shaft or tunnel work.

Cross and Stadia Hairs. Disappearing. Set in two diaphragms, so that either the cross or stadia hairs can be brought into focus as desired. Stadia hairs are adjusted to read one foot on a rod 100 feet from the instrument. Constant supplied with each transit.

Shifting Centers. The centers are extra long and made of three different kinds of metal to reduce friction.

The Four Leveling Arms are slotted and can be adjusted by means of the set screws.

Screws. All tangent and leveling screws are made of German Silver. Clamp and tangent screws of improved construction with counter spring. Clamp screw to lower plate is flat and placed directly in back of the tangent screw which is round (see cut). This enables the engineer to readily distinguish which screw he is using.

Bubbles. Two finely graduated bubbles of 25 seconds sensitiveness, at right angles to each other, attached to the extreme edge of the limb plate, which position insures greater accuracy in leveling.

Horizontal Limb, 6 inches, graduated on Solid Silver to 20 minutes, and numbered from 0° - 360° in two rows running in opposite directions, the slant of the figures denoting the direction.

Verniers. Two opposite verniers (at 30 deg. to the telescope) reading to 30 seconds (see page 201). Ground glass shades attached to both verniers.

Compass, divided on Solid Silver to half degrees, with improved bar needle $\frac{4}{4}$ inch. With variation plate and capstan head for setting same.

Weight of instrument without tripod, about 13 lbs.

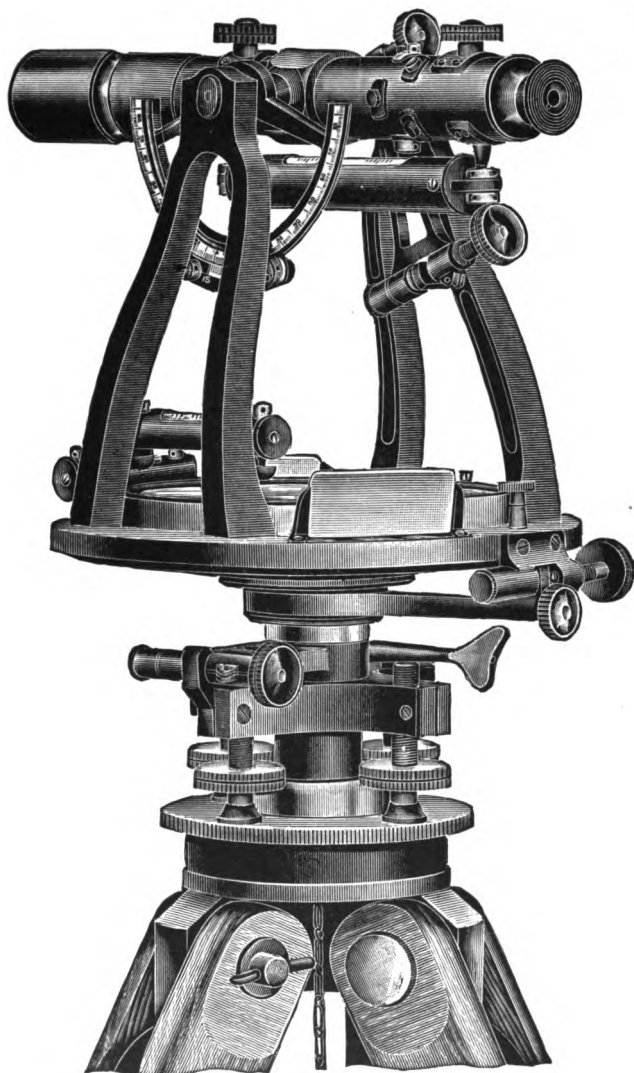
Instrument complete, in finely polished box, with plumb bob, reading glass, center key, adjusting pins, gossamer bag and tripod
No. 7400.....each, \$200.00

7602 Same as No. 7600, but with horizontal limb plate $6\frac{1}{2}$ in., each, 205.00

Optional Additions to Either of Above Transits, To Order Only.

20 seconds verniers, instead of 30 seconds..... \$10.00
Astronomical (inverting) eye-piece, instead of erecting..... 10.00
Three Leveling Arms instead of four arms..... 15.00
Magnifying glasses attached to verniers on limb plate..... 10.00
60 seconds verniers, at same price as Nos. 7600 and 7602.

 OUR IRON CLAD GUARANTEE, see page 196.



7610 "Extra Fine Quality" Transit, with Vertical Arc.

(For description see page 221)



Kolesch Transit No. 7610

Extra Fine Quality.

7610 "Extra Fine Quality" Transit, for high-grade work requiring extreme accuracy and precision. **Bent Standards.** With powerful achromatic terrestrial (erecting) telescope about 11 inches long. Magnifying power about 24 diameters. Will focus 5 or 6 feet from the instrument, which is very convenient on short offsets. Lenses are especially made and selected by the best European optical works. Aperture of object glass $1\frac{3}{16}$ inches. Dust Cap and Sun Shade. Improved rack and pinion movement to eye-piece and objective. Fine bubble ($4\frac{1}{4}$ in. vial) of **30 seconds** sensitiveness, graduated on the glass and attached to the extreme end of telescope. This position of the bubble insures greater accuracy in leveling and makes it visible in its entire length from either side. Telescope reversible from both ends. Center point in top of telescope axis for the purpose of setting under suspended plumb bob in shaft or tunnel work.

Cross and Stadia Hairs. Disappearing. Set in two diaphragms, so that either the cross or stadia hairs can be brought into focus as desired. Stadia hairs are adjusted to read one foot on a rod 100 feet from the instrument. Constant supplied with each transit.

Shifting Centers. The centers are extra long and made of three different kinds of metal to reduce friction.

The Four Leveling Arms are slotted and can be adjusted by means of the set screws.

Screws. All tangent and leveling screws are made of German Silver. Clamp and tangent screws of improved construction with counter spring. Clamp screw to lower plate is flat and placed directly in back of the tangent screw which is round. (See cut). This enables the engineer to readily distinguish which screw he is using.

Bubbles. Two finely graduated bubbles of **25 seconds** sensitiveness, at right angles to each other, attached to the extreme edge of the limb plate, which position insures greater accuracy in leveling.

Horizontal Limb, 6 inches, graduated on **Solid Silver** to 20 minutes, and numbered from 0° - 360° in two rows running in opposite directions, the slant of the figures denoting the direction.

Verniers. Two opposite verniers (at 30 deg. to the telescope) reading to 30 seconds, (see page 201). Ground glass shades attached to both verniers.

Compass, divided on **Solid Silver** to half degrees, with improved bar needle, $4\frac{1}{2}$ inch. With variation plate and capstan head for setting same.

Vertical Arc, 5 in. graduated on **Solid Silver** to 30 minutes with vernier reading to 60 seconds.

Weight of instrument without tripod, 13 lbs.

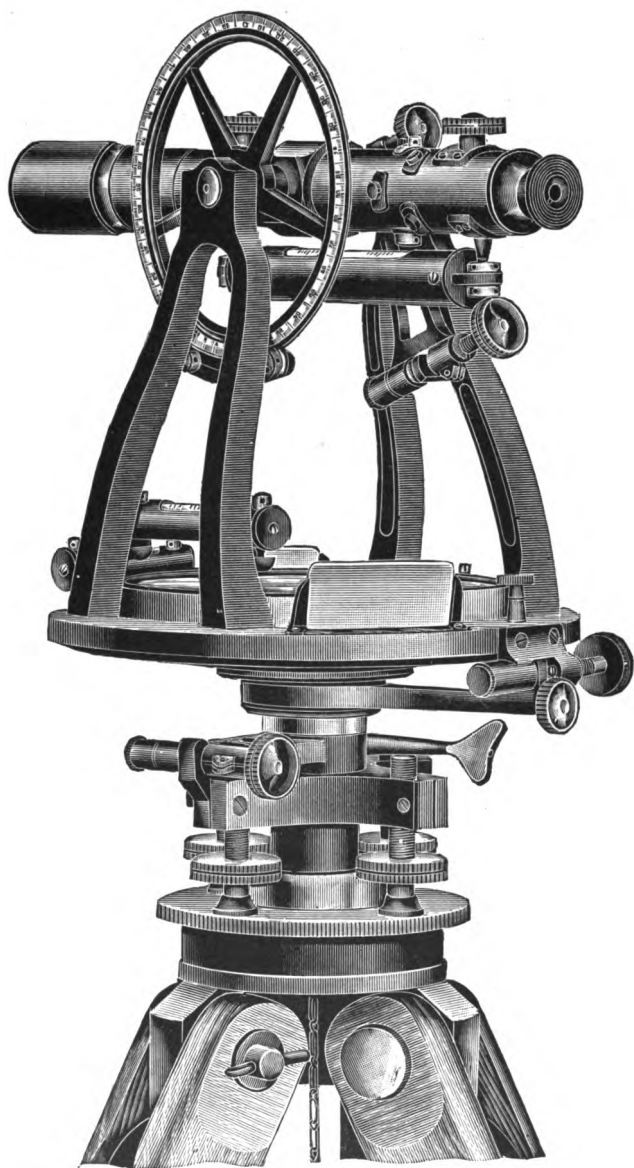
Instrument complete, in finely polished box, with plumb bob, reading glass, center key, adjusting pins, gossamer bag and tripod
No. 7400each, \$215.00

7612 Same as No. 7610, but with horizontal limb plate $6\frac{1}{2}$ in., and compass needle, 5 inch.....each, \$220.00

Optional Additions to Either of Above Transits, To Order Only.

20 seconds verniers, instead of 30 seconds..... \$10.00
Astronomical (inverting) eye-piece, instead of erecting..... 10.00
Three leveling arms, instead of four..... 15.00
Magnifying glasses attached to verniers on limb plate..... 10.00
60 seconds verniers, at same price as Nos. 7610 and 7612.

☛ **OUR IRON CLAD GUARANTEE**, see page 196.



7622 "Extra Fine Quality" Transit, with Vertical Circle.

(For description see page 223.)

Kolesch Transit No. 7620

Extra Fine Quality.

7620 "Extra Fine Quality" Transit for high-grade work requiring extreme accuracy and precision. **Bent Standards.** With powerful achromatic terrestrial (erecting) telescope about 11 inches long. Magnifying power 24 diameters. Will focus 5 or 6 feet from the instrument, which is very convenient on short offsets. Lenses are especially made and selected by the best European optical works. Aperture of object glass $1 \frac{3}{16}$ inches. Dust Cap and Sun Shade. Improved rack and pinion movement to eye-piece and objective. Fine bubble ($\frac{1}{4}$ in. vial) of 30 seconds sensitiveness, graduated on the glass and attached to the extreme end of telescope. This position of the bubble insures greater accuracy in leveling and makes it visible in its entire length from either side. Telescope reversible from both ends. Center point in top of telescope axis for the purpose of setting under suspended plumb bob in shaft or tunnel work.

Cross and Stadia Hairs. Disappearing. Set in two diaphragms, so that either the cross or stadia hairs can be brought into focus as desired. Stadia Hairs are adjusted to read one foot on a rod 100 feet from the instrument. Constant supplied with each transit.

Shifting Centers. The centers are extra long and made of three different kinds of metal to reduce friction.

The Four Leveling Arms are slotted and can be adjusted by means of the set screws.

Screws. All tangent and leveling screws are made of German Silver. Clamp and tangent screws of improved construction with counter spring. Clamp screw to lower plate is flat and placed directly in back of the tangent screw which is round. (See cut). This enables the engineer to readily distinguish which screw he is using.

Bubbles. Two finely graduated bubbles of 25 seconds sensitiveness, at right angles to each other, attached to the extreme edge of the limb plate, which position insures greater accuracy in leveling.

Horizontal Limb, 6 inches, graduated on **Solid Silver** to 20 minutes, and numbered from 0° - 360° in two rows running in opposite directions, the slant of the figures denoting the direction.

Verniers. Two opposite verniers (at 30 deg. to the telescope) reading to 30 seconds, (see page 201). Ground glass shades attached to both verniers.

Compass, divided on **Solid Silver** to half degrees, with improved bar needle $\frac{1}{2}$ inch. With variation plate and capstan head for setting same.

Vertical Circle, 5 in. graduated on **Solid Silver** to 30 minutes with vernier reading to 60 seconds.

Weight of instrument without tripod, about 14 lbs.

Instrument complete, in finely polished box, with plumb bob, reading glass, center key, adjusting pins, gossamer bag and tripod
No. 7400each, \$220.00

7622 Same as No. 7620, but with horizontal limb plate, $6\frac{1}{2}$ inch, and compass needle, 5 incheach, 225.00

Optional Additions to Either of Above Transits, To Order Only.

20 seconds verniers, instead of 30 seconds..... \$10.00
Astronomical (inverting) eye-piece, instead of erecting..... 10.00
Three leveling arms instead of four 15.00
Magnifying glasses attached to verniers on limb plate..... 10.00
60 seconds verniers, at same price as Nos. 7620 and 7622.

 OUR IRON CLAD GUARANTEE, see page 196.

Improved Mountain and Mining Transit.



7630 Improved Mountain and Mining Transit.

For description, see page 225

Improved Mountain and Mining Transit.

7630 Mountain and Mining Transit, Bent Standards, with powerful achromatic terrestrial telescope about $8\frac{1}{2}$ inches long. Magnifying power about 24 diameters, which we have found to be the best for field and definition. The lenses are especially made and selected by the best European optical works. Aperture of object glass 1 inch. Dust cap and sun shade. Improved rack and pinion movement to eye-piece and objective. Fine bubble (4 inch vial) to telescope, graduated on the glass. Telescope reversible from both ends.

Cross and Stadia Hairs. Stadia Hairs are **disappearing**, so that Cross Hairs or Stadia Hairs can be used as desired.

Shifting Center. The centers are extra long and made of three different kinds of metal to reduce friction.

The Four Leveling Arms are slotted and can be adjusted by means of the set screws.

Screws. All clamp, tangent and leveling screws are made of German silver. Clamp and tangent screws of improved construction, with counter spring. Clamp screw to upper plate is round, and clamp screw to lower plate is flat. This enables the Engineer to distinguish which screw he is using.

Horizontal Limb, $5\frac{1}{2}$ inches, graduated on **solid silver** to 20 minutes, and numbered as shown on page 200. Two finely graduated bubbles, at right angles to each other.

Verniers, two opposite verniers (at 30° to telescope), reading to 30 seconds. See page 201.

Compass, divided on **solid silver** to half degrees, with variation plate and improved bar needle about 4 inches long.

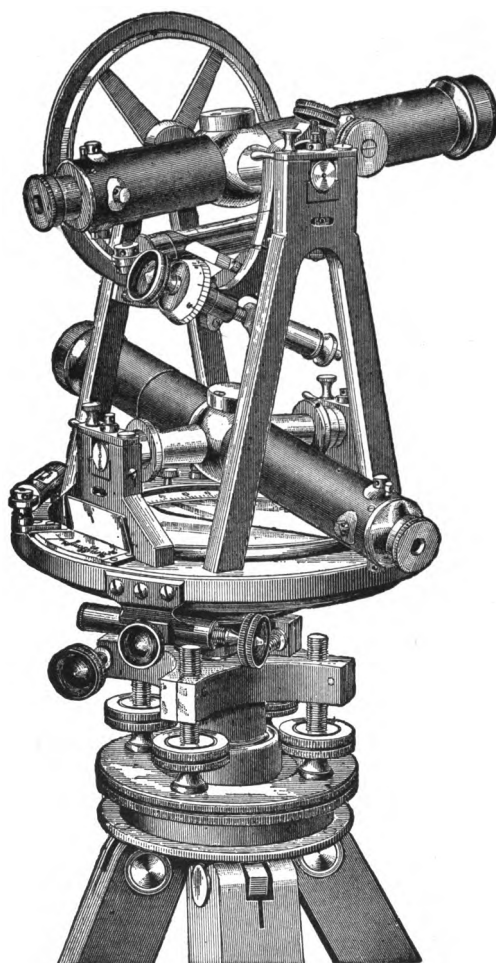
Vertical Circle, 4 inches, graduated on **solid silver** to half degrees, with vernier reading to single minutes.

Instrument complete, in finely polished mahogany box, with plumb bob, adjusting pins, center key, screw driver, reading glass and solid or split leg tripod.....each, \$220.00

- | | | |
|-------------|--|----------|
| 7632 | Mountain and Mining Transit , same as No. 7630, but with vertical arc instead of vertical circle..... | “ 205.00 |
| 7633 | Mountain and Mining Transit , same as No. 7630, but without vertical circle..... | “ 190.00 |



Right-Angle Transit.



For description, see page 227



Right-Angle

Transit.

7640 Right-Angle Transit, Straight Standards, with theodolite axis and gradient screw. Two interchangeable powerful achromatic astronomical telescopes. Upper telescope about 10 inches long, lower telescope about 11 inches long. Magnifying power of telescopes about 24 diameters, which we have found to be the best for field and definition. Lenses are especially made and selected by the best European optical works. Diameter of object glasses $1\frac{1}{8}$ inches. Stadia hairs in both telescopes, also dust caps, sun shades and improved rack and pinion movements to objectives. Fine bubble (4 inch vial) to upper telescope graduated on the glass. Clamp and tangent screws of improved pattern with counter springs. Clamp screw to upper plate is round, and clamp screw to lower plate is flat. This enables the Engineer to distinguish which screw he is using.

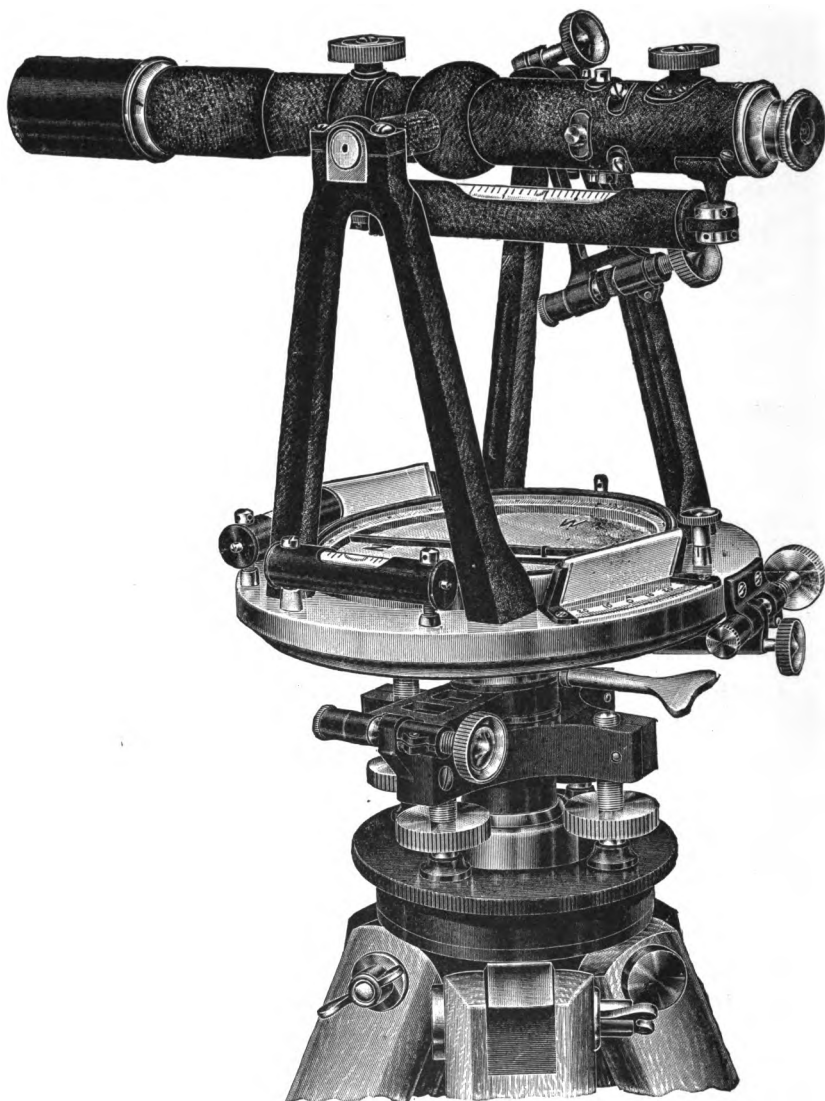
Compass divided on **solid silver** to half degrees, with improved needle $4\frac{1}{2}$ inches. Horizontal limb, 6 inches, graduated on **solid silver** to 20 minutes, two opposite verniers, reading to 20 seconds, with glass shades. Two finely graduated bubbles to horizontal limbs.

Vertical Circle, 5 inches, graduated on **solid silver** to half degrees, reading by vernier to single minutes. Shifting center. All leveling and tangent screws of German silver.

Instrument complete, with plumb bob, adjusting pins, etc., in finely polished mahogany box, with tripod.....each, \$350.00

The above can also be made with terrestrial telescopes of the same patterns as shown in Transits No. 7500-7633.

The above style represents an instrument of which we have made a number for city work. As they have to be made to order, we can make any changes desired to suit the requirements of the special work they are intended for. Prices of special instruments on application.



7650 "Engineers" Transit.

(For description see page 229.)

Kolesch "Engineers" Transit, No. 7650

7650 "Engineers" Transit. Straight Standards. With powerful achromatic terrestrial (erecting) telescope about 11 inches long. Magnifying power about 24 diameters. Will focus 5 or 6 feet from the instrument, which is very convenient on short offsets. Lenses are of the very best domestic make. Aperture of object glass, $1 \frac{3}{16}$ inch. Dust Cap and Sun Shade. Improved rack and pinion movement to eye-piece and objective. Fine bubble ($\frac{1}{4}$ inch vial) of **35 seconds** sensitiveness, graduated on the glass, and attached to the extreme end of the telescope. This position of the bubble insures greater accuracy in leveling and makes it visible in its entire length from either side. Telescope reversible from both ends. Center point in top of telescope axis for the purpose of setting under suspended plumb bob in shaft or tunnel work.

Cross and Stadia Hairs are **disappearing**, so that either can be brought into focus as desired. Constant supplied with each transit.

Shifting Centers. The centers are extra long and made of three different kinds of metal to reduce friction.

The Four Leveling Arms are slotted and can be adjusted by means of the set screws.

Screws. All clamp and tangent screws of improved construction with counterspring. Clamp screw to lower plate is flat and placed directly in back of the tangent screw, which is round (see cut). This enables the engineer to readily distinguish which screw he is using.

Bubbles. Two finely graduated bubbles of **30 seconds** sensitiveness, at right angles to each other, attached to the extreme edge of the limb plate, which position insures greater accuracy in leveling.

Horizontal Limb, 6 inches, graduated on **Solid Silver** to 20 minutes and numbered from 0° - 360° in two rows running in opposite directions, the slant of the figures denoting the direction.

Verniers. Two opposite verniers (at 30 deg. to the telescope), reading to 30 seconds (see page 201). Ground glass shades attached to both verniers.

Compass, divided on **Solid Silver** to half degrees, with improved bar needle $\frac{1}{2}$ inch. With variation plate and capstan head for setting same.

Weight of instrument without tripod, about 14 lbs.

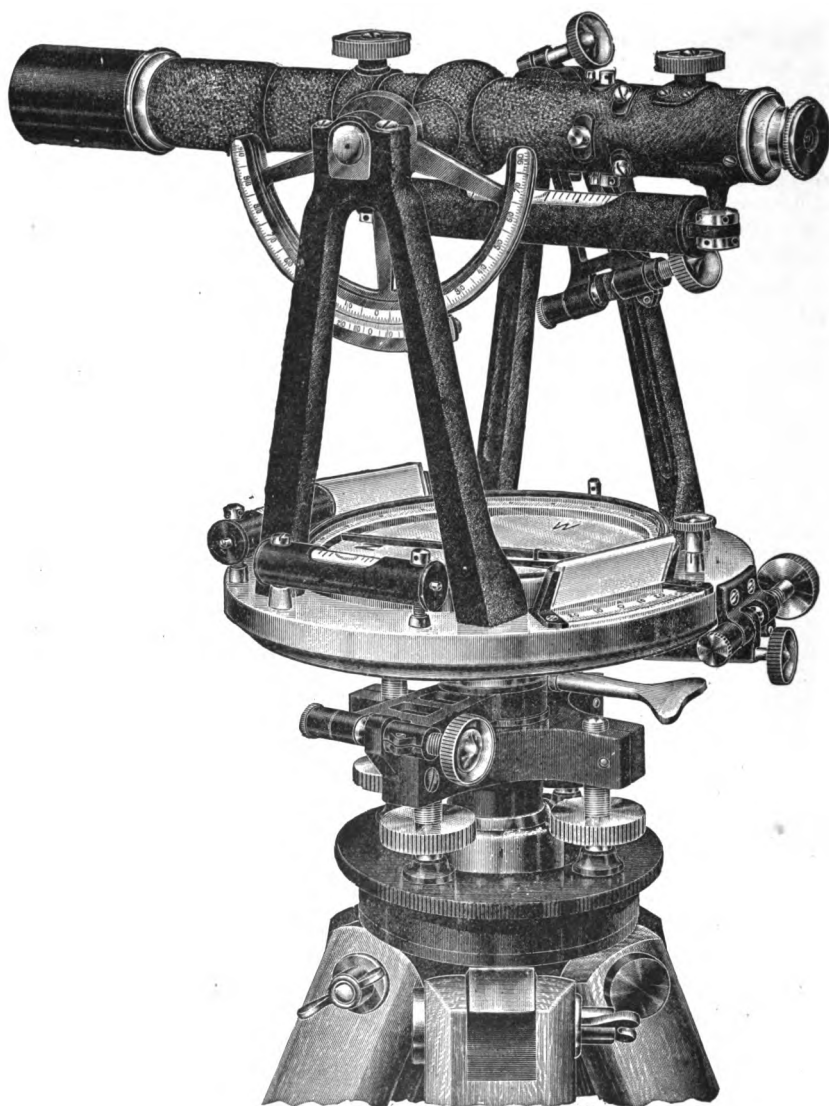
Instrument complete, in finely polished box, with plumb bob, reading glass, center key, adjusting pins, gossamer bag and tripod
No. 7400each, \$160.00

7652 Same as No. 7650, with horizontal limb plate, $\frac{6}{16}$ in., and compass needle, 5 inch.....each, \$165.00

Optional Additions to Either of Above Transits, To Order Only.

20 seconds verniers, instead of 30 seconds.....	\$10.00
Astronomical (inverting) eye-piece, instead of erecting.....	10.00
Three leveling arms, instead of four.....	15.00
Magnifying glasses attached to verniers on limb plate.....	10.00
60 seconds verniers, at same price as No. 7650 and 7652.	

 **OUR IRON CLAD GUARANTEE**, see page 196.



7660 "Engineers" Transit, with Vertical Arc.

(For description see Page 231.)

Kolesch "Engineers" Transit, No. 7660

7660 "Engineers" Transit. Straight Standards. With powerful achromatic terrestrial (erecting) telescope about 11 inches long. Magnifying power 24 diameters. Will focus 5 or 6 feet from the instrument, which is very convenient on short offsets. Lenses are of the very best domestic make. Aperture of object glass 1 3-16 inch. Dust Cap and Sun Shade. Improved rack and pinion movement to eye-piece and objective. Fine bubble ($4\frac{1}{4}$ inch vial) of **35 seconds** sensitiveness, graduated on the glass and attached to the extreme end of the telescope. This position of the bubble insures greater accuracy in leveling and makes it visible in its entire length from either side. Telescope reversible from both ends. Center point in top of telescope axis for the purpose of setting under suspended plumb bob in shaft or tunnel work.

Cross and Stadia Hairs are disappearing so that either can be brought into focus as desired. Constant supplied with each transit.

Shifting Centers. The centers are extra long and made of three different kinds of metal to reduce friction.

The Four Leveling Arms are slotted and can be adjusted by means of the set screws.

Screws. All clamp and tangent screws of improved construction with counterspring. Clamp screw to lower plate is flat and placed directly in back of the tangent screw, which is round (see cut). This enables the engineer to readily distinguish which screw he is using.

Bubbles. Two finely graduated bubbles of **30 seconds** sensitiveness, at right angles to each other, attached to the extreme edge of the limb plate, which position insures greater accuracy in leveling.

Horizontal Limb, 6 inches graduated on **Solid Silver** to 20 minutes and numbered from 0° - 360° in two rows running in opposite directions, the slant of the figures denoting the direction.

Verniers. Two opposite verniers (at 30 deg. to the telescope) reading to 30 seconds (see page 201). Ground glass shades attached to both verniers.

Compass, divided on **Solid Silver** to half degrees, with improved bar needle $4\frac{1}{2}$ inch. With variation plate and capstan head for setting same.

Vertical Arc, 5 inch, graduated on **Solid Silver** to 30 minutes, with vernier reading to 60 seconds.

Weight of instrument without tripod, about 14 lbs.

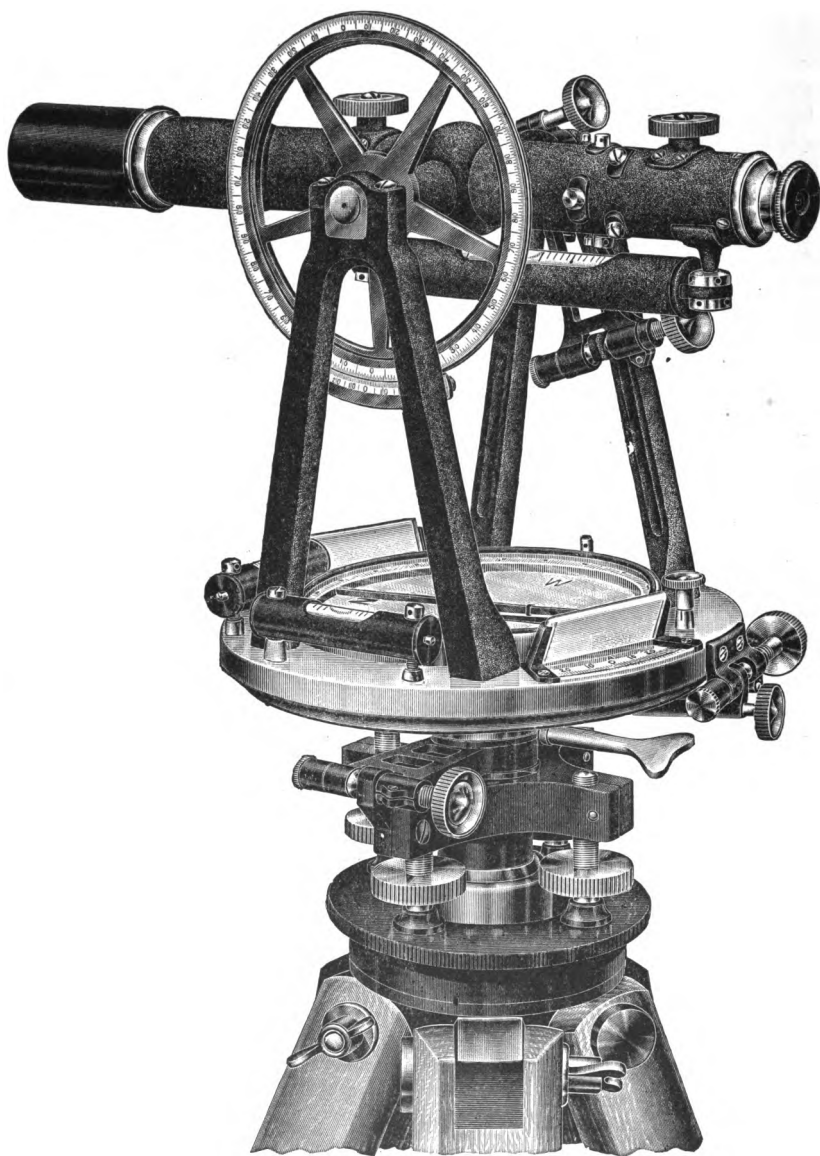
Instrument complete, in finely polished box, with plumb bob, reading glass, center key, adjusting pins, gossamer bag and tripod
No. 7400each, \$175.00

7662 Same as No. 7660, but with horizontal limb plate, $6\frac{1}{2}$ inch, and compass needle, 5 incheach, 180.00

Optional Additions to Either of Above Transits, To Order Only.

20 seconds verniers, instead of 30 seconds.....	\$10.00
Astronomical (inverting) eye-piece, instead of erecting.....	10.00
Three leveling arms, instead of four.....	15.00
Magnifying glasses attached to verniers on limb plate.....	10.00
60 seconds verniers, at same price as Nos. 7660 and 7662.	

 **OUR IRON CLAD GUARANTEE,** see page 196.



7670 "Engineers" Transit, with Vertical Circle.

(For description see page 233.)

Kolesch "Engineers" Transit No. 7670

7670 "Engineers" Transit. Straight Standards. With powerful achromatic terrestrial (erecting) telescope about 11 inches long. Magnifying power about 24 diameters. Will focus 5 or 6 feet from the instrument, which is very convenient on short offsets. Lenses are of the very best domestic make. Aperture of object glass $1\frac{3}{16}$ inch. Dust Cap and Sun Shade. Improved rack and pinion movement to eye-piece and objective. Fine Bubble ($4\frac{1}{4}$ in. vial) of 35 seconds sensitiveness graduated on the glass and attached to the extreme end of the telescope. This position of the bubble insures greater accuracy in leveling and makes it visible in its entire length from either side. Telescope reversible from both ends. Center point in top of telescope axis for the purpose of setting under suspended plumb bob in shaft or tunnel work.

Cross and Stadia Hairs are disappearing so that either can be brought into focus as desired. Constant supplied with each transit.

Shifting Centers. The centers are extra long and made of three different kinds of metal to reduce friction.

The Four Leveling Arms are slotted and can be adjusted by means of the set screws.

Screws. All clamp and tangent screws of improved construction with counterspring. Clamp screw to lower plate is flat and placed directly in back of the tangent screw which is round (see cut). This enables the engineer to readily distinguish which screw he is using.

Bubbles. Two finely graduated bubbles of 30 seconds sensitiveness, at right angles to each other, attached to the extreme edge of the limb plate, which position insures greater accuracy in leveling.

Horizontal Limb, 6 inches, graduated on Solid Silver to 20 minutes and numbered from 0° - 360° in two rows running in opposite directions, the slant of the figures denoting the direction.

Verniers. Two opposite verniers (at 30 deg. to the telescope) reading to 30 seconds (see page 201). Ground glass shades attached to both verniers.

Compass, divided on Solid Silver to half degrees, with improved bar needle, $4\frac{1}{2}$ inch. With variation plate and capstan head for setting same.

Vertical Circle, 5 in., graduated on Solid Silver to 30 minutes with vernier reading to 60 seconds.

Weight of instrument without tripod, about $14\frac{1}{2}$ lbs.

Instrument complete, in finely polished box, with plumb bob, reading glass, center key, adjusting pins, gossamer bag and tripod No. 7400.....each, \$180.00

7672 Same as No. 7670, but with horizontal limb plate $6\frac{1}{2}$ inch and compass needle, 5 in.....each, 185.00

7673 Same as No. 7670, but with $8\frac{1}{2}$ inch telescope, $5\frac{1}{2}$ inch horizontal limb plate, 4 inch compass needle and 4 inch vertical circleeach, \$175.00

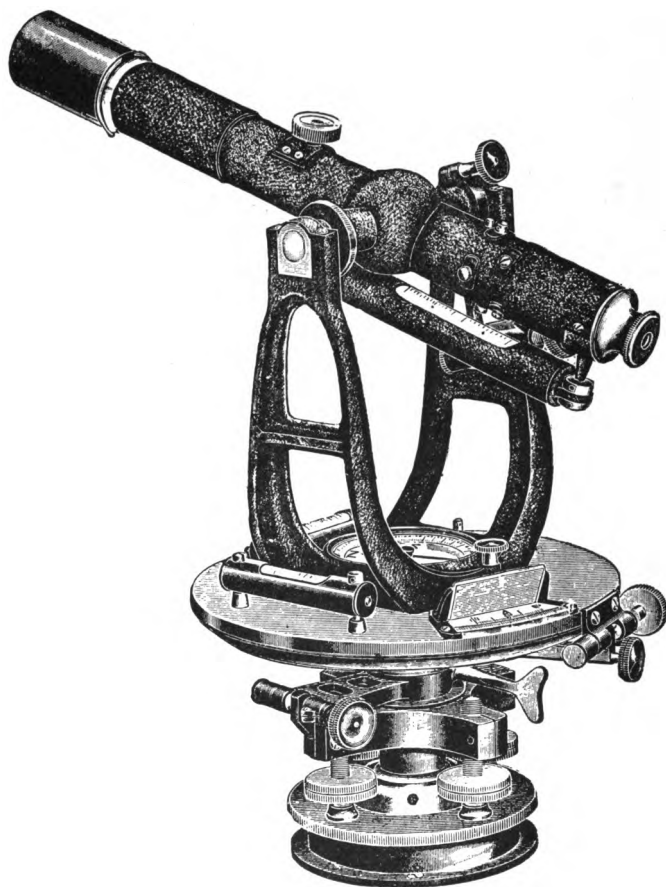
Optional Additions to Either of Above Transits, To Order Only.

20 seconds verniers, instead of 30 seconds..... \$10.00
Astronomical (inverting) eye-piece, instead of erecting..... 10.00
Three leveling arms, instead of four..... 15.00
Magnifying glasses attached to verniers on limb plate..... 10.00
60 seconds verniers, at same price as Nos. 7670-7673.

OUR IRON CLAD GUARANTEE, see page 196.



"Media" Transit



7680 "Media" Transit, with Compass.

(For description see page 235.)



Kolesch "Media" Transit No. 7680

7680 "Media" Transit. U Shape Standards attached to the flange of the inner center. Designed for light and moderately accurate work and especially recommended for mining and preliminary surveying and all similar work where a light, portable instrument is desired.

Telescope, about $8\frac{1}{2}$ inches long. Magnifying power 19 diameters. Rack and pinion movement to objective. Improved spiral motion slide to eye-piece. Aperture of object glass, 1 inch.

Long ground bubble of **60 seconds** sensitiveness, graduated on the glass, attached to the extreme end of telescope. This position of the bubble insures greater accuracy in leveling and makes it visible in its entire length from either side. Telescope reversible from both ends. Center point in top of telescope axis for the purpose of setting under suspended plumb bob in shaft or tunnel work.

Lenses of the very best domestic make.

Shifting Centers.

The Four Leveling Arms are slotted and can be adjusted by means of the set screws.

Screws. All clamp and tangent screws of improved construction with counterspring. Clamp screw to lower plate is flat and located directly behind the tangent screw, which is round (see cut). This makes them easily accessible to the hand and enables the engineer to readily distinguish which screw he is using.

Bubbles. Two finely graduated bubbles of **50 seconds** sensitiveness, at right angles to each other, attached to the extreme edge of limb plate, which position insures greater accuracy in leveling.

Horizontal Limb, 5 inches, divided on **Solid Silver** to 30 minutes, and numbered from 0° - 360° in two rows running in opposite directions, the slant of the figures denoting the direction.

Verniers. One vernier, at 30 degrees to telescope, reading to 60 seconds (see page 201).

Compass, on raised ring, silvered, divided to 60 minutes with 2 inch needle and jeweled center. With variation plate and capstan head for setting same.

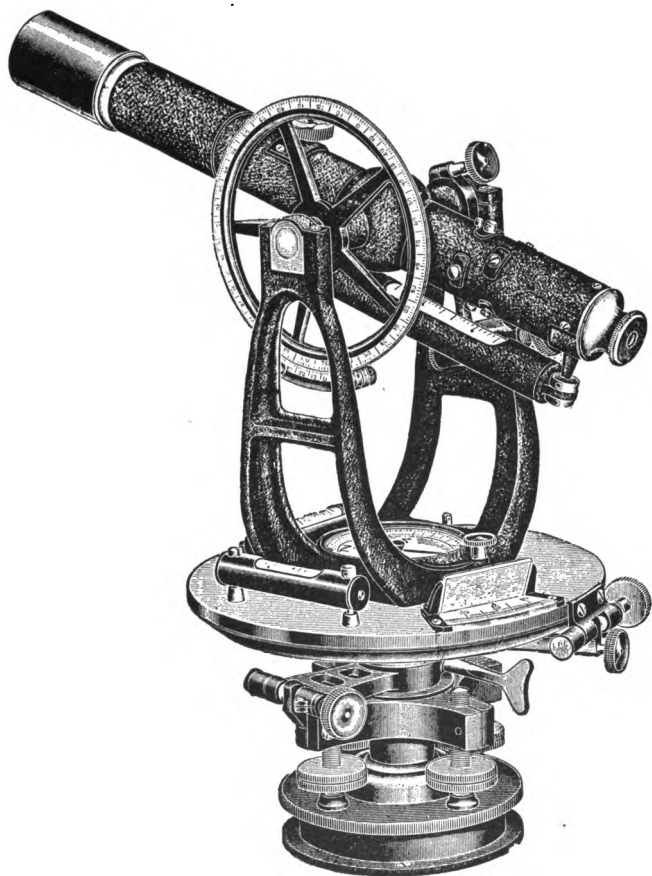
Weight of instrument without tripod, about $7\frac{1}{2}$ lbs.

Instrument complete, in finely polished box, with plumb bob, reading glass, adjusting pins and tripod No. 7410.....each, \$120.00

 OUR IRON CLAD GUARANTEE, see page 196.



"Media" Transit



7690 "Media" Transit, with Compass and Vertical Circle.

(For description see page 237.)

Kolesch "Media" Transit, No. 7690

7690 "Media" Transit. U Shape Standards attached to the flange of the inner center. Designed for light and moderately accurate work and especially recommended for mining and preliminary surveying and all similar work where a light, portable instrument is desired.

Telescope, about $8\frac{1}{2}$ inches long. Magnifying power, 19 diameters. Dust Cap and Sun Shade. Rack and pinion movement to objective. Improved spiral motion slide to eye-piece. Aperture of object glass, 1 inch.

Long ground bubble of **60 seconds** sensitiveness, graduated on the glass, attached to the extreme end of the telescope. This position of the bubble insures greater accuracy in leveling and makes it visible in its entire length from either side. Telescope reversible from both ends. Center point in top of telescope axis for the purpose of setting under suspended plumb bob in shaft or tunnel work.

Lenses of the very best domestic make.

Cross and Stadia Hairs are disappearing, so that either can be brought into focus as desired.

Shifting Centers.

The Four Leveling Arms are slotted and can be adjusted by means of the set screws.

Screws. All clamp and tangent screws of improved construction with counterspring. Clamp screw to lower plate is flat and located directly behind the tangent screw, which is round (see cut). This makes them easily accessible to the hand and enables the engineer to readily distinguish which screw he is using.

Bubbles. Two finely graduated bubbles of **50 seconds** sensitiveness, at right angles to each other, attached to the extreme edge of the limb plate, which position insures greater accuracy in leveling.

Horizontal Limb, 5 inches, divided on **Solid Silver** to 30 minutes, and numbered from 0° - 360° in two rows running in opposite directions, the slant of the figures denoting the direction.

Verniers. One vernier, at 30 degrees to telescope, reading to 60 seconds (see page 201).


Compass, on raised ring, silvered, divided to 60 minutes with 2 inch needle and jeweled center. With variation plate and capstan head for setting same.

Vertical Circle, $3\frac{1}{2}$ inches, silvered, divided to degrees with vernier reading to 5 minutes.

Weight of instrument without tripod, about $7\frac{1}{2}$ lbs.

Instrument complete, in finely polished box, with plumb bob, reading glass, adjusting pins and tripod No. 7410.....each, \$130.00

7692 Same as No. 7690, but with vernier on vertical circle reading to 60 seconds.....each, \$135.00

 OUR IRON CLAD GUARANTEE, see page 196.

"Pioneer" Transit, with Compass



7700 "Pioneer" Transit, with Compass.

(For description see page 239.)

Kolesch "Pioneer" Transit No. 7700

7700 "Pioneer" Transit, designed for light and moderately accurate work, and especially recommended for rapid and preliminary surveying and all similar work, where a light, portable instrument is desired. Also largely used for mining engineering.

Telescope, about $8\frac{1}{2}$ inches long. Magnifying power 19 diameters. Dust cap and sun shade. Rack and pinion movement to objective. Improved spiral motion slide to eye-piece. Aperture of object glass, 1 inch.

Long ground bubble of **60 seconds** sensitiveness, graduated on the glass, attached to the extreme end of the telescope. This position of bubble insures greater accuracy in leveling and makes it visible in its entire length from either side. Telescope reversible from both ends. Center point in top of telescope axis for the purpose of setting under suspended plumb bob in shaft or tunnel work.

Lenses of the very best domestic make.

Cross and Stadia Hairs are disappearing, so that either can be brought into focus as desired.

Shifting Centers.

The Four Leveling Arms are slotted and can be adjusted by means of the set screws.

Screws. All clamp and tangent screws of improved construction with counterspring. Clamp screw to lower plate is flat and located directly behind the tangent screw, which is round (see cut). This makes them easily accessible to the hand and enables the engineer to readily distinguish which screw he is using.

Bubbles. Two finely graduated bubbles of **50 seconds** sensitiveness, at right angles to each other, attached to the extreme edge of the limb plate, which position insures greater accuracy in leveling.

Horizontal Limb, 5 inches, divided on **Solid Silver** to 30 minutes, and numbered from 0° - 360° in two rows running in opposite directions, the slant of the figures denoting the direction.

Vernier. One vernier, at 30 degrees to the telescope, reading to 60 seconds (see page 201).

Compass on raised ring, silvered, divided to 60 minutes, with 3 inch needle and jeweled center. With variation plate and capstan head for setting same.

Weight of instrument without tripod, about $7\frac{1}{2}$ lbs.

Instrument complete, in finely polished box, with plumb bob, reading glass, adjusting pins and tripod No. 7410.....each, \$100.00

 **OUR IRON CLAD GUARANTEE**, see page 196.

**"Pioneer" Transit, with Compass
and
Vertical Circle**



7710 "Pioneer" Transit, with Compass and Vertical Circle.

(For description see page 241.)



Kolesch "Pioneer" Transit, No. 7710

7710 "Pioneer" Transit, designed for light and moderately accurate work, and especially recommended for rapid and preliminary surveying and all similar work where a light, portable instrument is desired. Also largely used for mining engineering.

Telescope about $8\frac{1}{2}$ inches long. Magnifying power 19 diameters. Dust cap and sun shade. Rack and pinion movement to objective. Improved spiral motion slide to eye-piece. Aperture of object glass, 1 inch.

Long ground bubble of **60 seconds** sensitiveness, graduated on the glass, attached to the extreme end of the telescope. This position of the bubble insures greater accuracy in leveling and makes it visible in its entire length from either side. Telescope reversible from both ends. Center point in top of telescope axis for the purpose of setting under suspended plumb bob in shaft or tunnel work.

Lenses of the very best domestic make.

Cross and Stadia Hairs are disappearing, so that either can be brought in to focus as desired. Constant supplied with each transit.

Shifting Centers.

The Four Leveling Arms are slotted and can be adjusted by means of the set screws.

Screws. All clamp and tangent screws of improved construction with counterspring. Clamp screw to lower plate is flat and located directly behind the tangent screw, which is round (see cut). This makes them easily accessible to the hand and enables the engineer to readily distinguish which screw he is using.

Bubbles. Two finely graduated bubbles of **50 seconds** sensitiveness, at right angles to each other, attached to the extreme edge of the limb plate, which position insures greater accuracy in leveling.

Horizontal Limb, 5 inches, divided on **Solid Silver** to 30 minutes, and numbering from 0° - 360° in two rows running in opposite directions, the slant of the figures denoting the direction.

Verniers. One vernier, at 30 degrees to the telescope, reading to 60 seconds (see page 201).

Compass on raised ring, silvered, divided to 60 minutes, with 3 inch needle and jeweled center. With variation plate and capstan head for setting same.

Vertical Circle, $3\frac{1}{2}$ inches, silvered, divided to degrees with vernier reading to 5 minutes.

Weight of instrument without tripod, about $7\frac{1}{2}$ lbs.

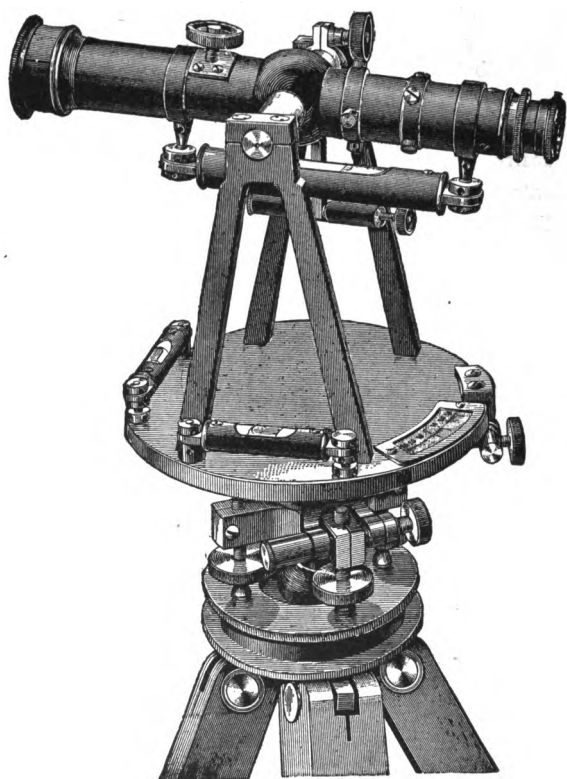
Instrument complete, in finely polished box, with plumb bob, reading glass, adjusting pins and tripod No. 7410...each, \$110.00

7712 Same as No. 7710, but with vernier on vertical circle, reading to 60 seconds.....each, 115.00

OUR IRON CLAD GUARANTEE, see page 196.



Kolesch "Builders" Transit
For
Builders, Architects
and
Construction Engineers



7720 "Builders" Transit.

(For description see page 243.)

Kolesch "Builders" Transit No. 7720

7720 "Builders" Transit, designed for light and moderately accurate work. Especially recommended to builders, architects and construction engineers for taking angles, leveling foundations, examining walls under way of construction, giving lines and levels for buildings, concrete work, street and sewer work, etc.

Telescope about $8\frac{1}{2}$ inches long. Magnifying power 19 diameters. Dust Cap and Sun Shade. Rack and pinion movement to objective. Improved spiral motion slide to eye-piece. Aperture of object glass 1 inch.

Long ground bubble of **60 seconds** sensitiveness, graduated on the glass, attached to the extreme end of the telescope. This position of the bubble insures greater accuracy in leveling and makes it visible in its entire length from either side. Telescope reversible from both ends.

Lenses of the very best domestic make.

Cross Hairs, adjustable by means of the eye-piece.

Shifting Centers.

The Four Leveling Arms are slotted and can be adjusted by means of the set screws.

Screws. All clamp and tangent screws of improved construction with counterspring. Clamp screw to upper plate is round and clamp screw to lower plate is flat (see cut). This enables the engineer to readily distinguish which screw he is using.

Bubbles. Two finely graduated bubbles of **50 seconds** sensitiveness, at right angles to each other, attached to the extreme edge of the limb plate, which position insures greater accuracy in leveling.

Horizontal Limb, 5 inches, divided on **Solid Silver** to 30 minutes, and numbered from 0° - 360° in two rows running in opposite directions, the slant of the figures denoting the direction.

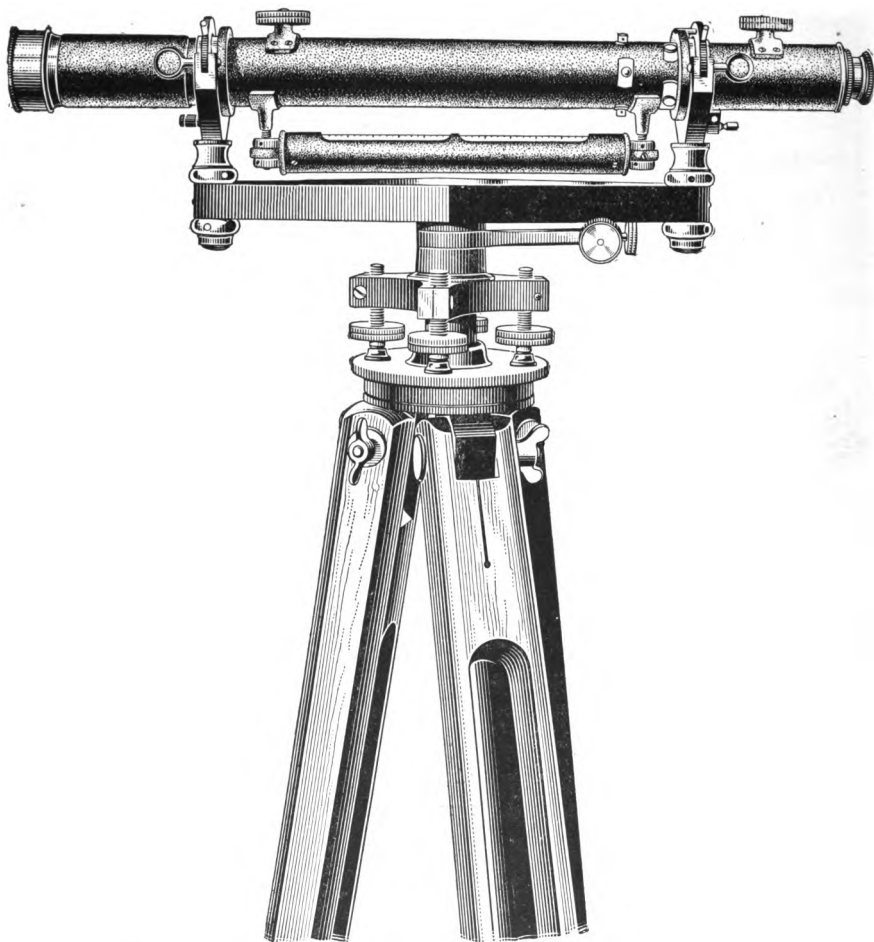
Verniers. One vernier, at 30 degrees to the telescope, reading to 60 seconds (see page 201).

Weight of instrument without tripod, about 7 lbs.

Instrument complete, in finely polished box, with plumb bob, reading glass, adjusting pins and tripod No. 7410.....each, \$85.00

7722 Same as No. 7720, but with vertical circle $3\frac{1}{2}$ inch, divided to degrees, reading by vernier to 5 minutes.....each, 95.00

 **OUR IRON CLAD GUARANTEE**, see page 196.



7800 "Improved" Y Level. (For description see Page 245.)

Kolesch "Improved" Y Level No. 7800

Extra Fine Quality.

7800 "Improved" Y Level, with powerful achromatic terrestrial (erecting) telescope 18 inches long. Magnifying power about 28 diameters, which we have found to be the best for field and definition, both of which are liable to be lost when using excessive magnification. Will focus 8 feet from the instrument.

Lenses are especially made and selected by the best European optical works. Aperture of object glass $1\frac{3}{8}$ in. Improved rack and pinion movement to eye-piece and objective.

Bubbles. Very finely graduated bubble of 20 seconds sensitiveness, graduated on the glass, attached to telescope. Length of bubble 7 inches. Adjustable vertically and horizontally.

Centers and Telescope Rings are made of phosphor bronze and very stout and long.

Telescope Bar is cast in one piece and of a construction patterned after a bridge truss, combining the utmost strength and rigidity with the minimum possible weight.

Telescope will revolve in the Y's without opening the clips, and by means of an improved stop, the cross hairs can be instantly placed in a vertical and horizontal position. Dust Cap and Sun Shade.

The Four Leveling Arms are slotted and can be adjusted by means of the set screws.

Screws. All tangent and leveling screws are made of German Silver. Clamp and tangent screws are attached to, and directly underneath the bar, which position renders them less liable to injury than any other, and makes them easily accessible to the hand. Tangent screws of improved construction with counterspring.

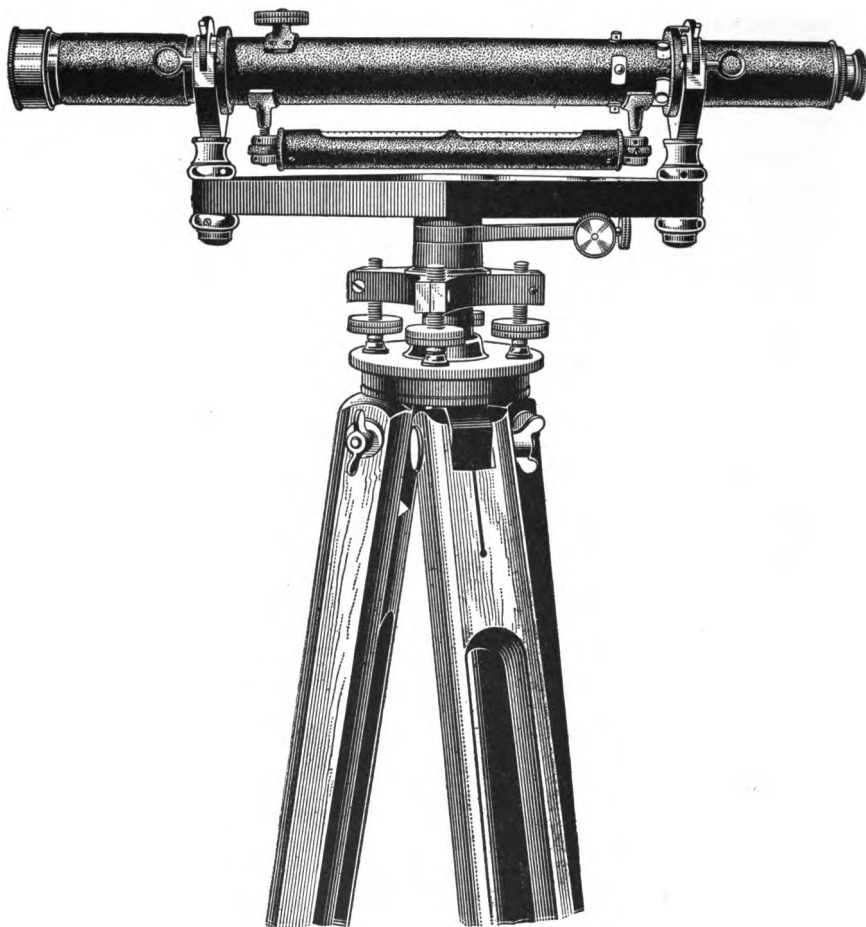
Weight of level without tripod, $10\frac{1}{2}$ lbs.

Instrument complete, in finely polished box, with adjusting pins, gossamer bag and tripod No. 7400.....each,	\$125.00
7801 Same as No. 7800, but with telescope 15 inches long..each,	100.00
7802 Same as No. 7800, but with telescope 20 inches long..each,	135.00
7803 Same as No. 7800, but with telescope 22 inches long..each,	140.00

Optical Additions to Any of Above Y Levels, To Order Only.

Steel Centers in place of the regular centers.....	\$10.00
Astronomical (inverting) eye-piece, instead of erecting.....	10.00
Three leveling arms instead of four arms.....	15.00
Reflecting mirror attached to telescope bar.....	6.00
Bubble to telescope, 10 seconds sensitiveness.....	5.00

 **OUR IRON CLAD GUARANTEE**, see page 196.



7820 "Engineers" Y Level. (For description see Page 247.)

Kolesch "Engineers" Y Level No. 7820

7820 "Engineers" Y Level, with powerful achromatic terrestrial (erecting) telescope 18 inches long. Magnifying power about 28 diameters, which we have found to be the best for field and definition, both of which are liable to be lost when using excessive magnification. Will focus 8 feet from the instrument.

Lenses of the very best domestic make. Aperture of object glass $1\frac{3}{8}$ in. Improved rack and pinion movement to objective. Eye-piece adjustable for focussing the cross hairs.

Bubbles. Very finely graduated bubble of 25 seconds sensitiveness, graduated on the glass, attached to telescope. Length of bubble 7 inches, adjustable vertically and horizontally.

Centers and Telescope Rings are made of phosphor bronze and very stout and long.

Telescope Bar is cast in one piece and of a construction patterned after a bridge truss, combining the utmost strength and rigidity with the minimum possible weight.

Telescope will revolve in the Y's without opening the clips, and is provided with a stop so that cross hairs can be instantly brought into a vertical and horizontal position.

The Four Leveling Arms are slotted and can be adjusted by means of the set screws.

Screws. Clamp and tangent screws are attached to and directly underneath the telescope bar, which position renders them less liable to injury than any other, and makes them easily accessible to the hand. Tangent screw of improved construction with counterspring.

Weight of level without tripod, about $10\frac{1}{2}$ lbs.

Instrument complete, in finely polished box, with adjusting pins, gossamer bag and tripod No. 7400.....each, \$100.00

7821 Same as No. 7820, but with telescope 15 inches long..each, 90.00

7822 Same as No. 7800, but with telescope 20 inches long..each, 110.00

7823 Same as No. 7800, but with telescope 22 inches long..each, 120.00

Optional Additions to Either of Above Y Levels, To Order Only.

Steel centers in place of the regular centers..... \$10.00

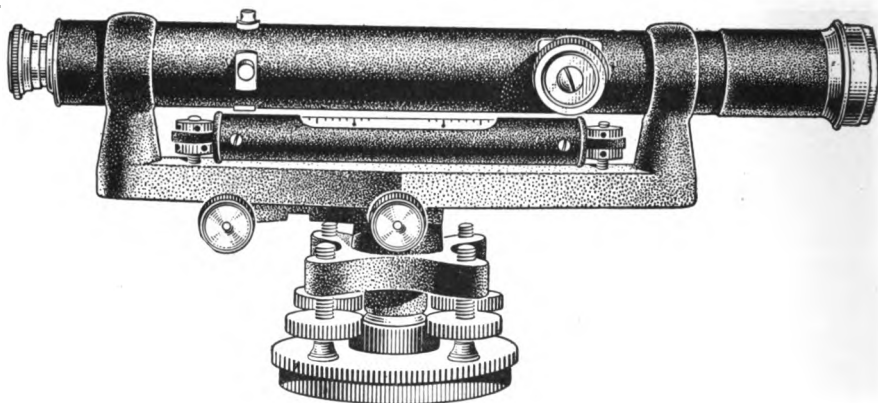
Astronomical (inverting) eye-piece, instead of erecting..... 10.00

Three leveling arms, instead of four arms..... 15.00

 OUR IRON CLAD GUARANTEE, see page 196.



Kolesch "Dumpy" Level No. 7830



7830 "Dumpy" Level with powerful achromatic terrestrial (erecting) telescope 18 inches long. Magnifying power about 28 diameters, which we have found to be the best for field and definition, both of which are liable to be lost when using excessive magnification. Will focus 8 feet from the instrument.

Lenses of the very best domestic make. Aperture of object glass $1\frac{3}{8}$ inch. Improved rack and pinion movement to objective. Eye-piece adjustable for focusing the cross-hairs.

Bubbles. Very finely graduated bubble of 30 seconds sensitivity, graduated on the glass attached to the telescope bar.

Centers are made of phosphor bronze and very stout and long.

Telescope Bar and Rings are of an improved construction designed to produce a very strong instrument, which is not liable to get out of adjustment under the most severe conditions.

The Four Leveling Arms are slotted and can be adjusted by means of the set screws.

Screws. Clamp and tangent screws are attached to, and directly underneath the telescope bar, which position renders them less liable to injury than any other, and makes them easily accessible to the hand. Tangent screw of improved construction with counter spring.

Weight of level without tripod, about $10\frac{1}{2}$ lbs.

Instrument complete, in finely polished box, with adjusting pins, gossamer bag and tripod No. 7400.....each, \$100.00

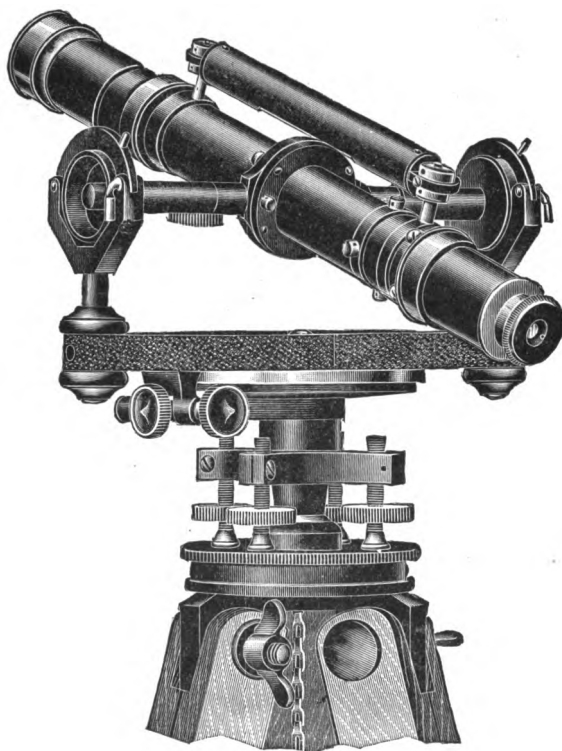
7831 Same as No. 7830, but with telescope 15 inches long....each, 75.00

Optional Additions to Either of Above Dumpy Levels, To Order Only.

Steel centers in place of the regular centers	\$10.00
Astronomical (inverting) eye-piece, instead of erecting.....	10.00
Three leveling arms instead of four arms.....	15.00

☛ OUR IRON CLAD GUARANTEE, see page 196.

Kolesch "Builders" Tilting Level No. 7850



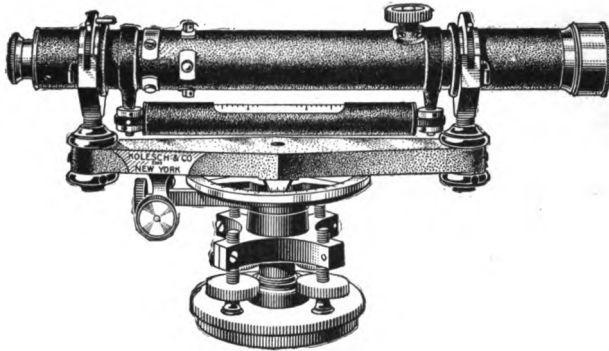
7850 "Builders" Tilting Level, designed especially for the use of builders, architects and contractors for leveling and plumbing walls, giving lines and levels for buildings, laying out angles, grading streets, sewers, drains, etc.

Telescope about 12 inches long, magnifying power 19 diameters. **Lenses** of the very best domestic make. Objective $1\frac{1}{8}$ in. Dust cap and sun shade. Rack and pinion movement to objective. Adjustable eye-piece for focussing cross hairs. **Fine bubble** ($\frac{1}{4}$ in. vial) of 60 seconds sensitiveness, graduated on the glass, attached to the telescope. **Improved device** for locking the clips in the Y's. The telescope is fitted with an adjustable collar into which the two trunnions, furnished with the instrument, can be inserted by means of a screw thread. In this position, the level can be used as a transit as per above illustration. **Horizontal Circle**, 3 inches, divided to degrees, reading by a vernier, attached to the spindle, to 5 minutes. This circle is held in place by a friction clutch and can be set at zero at any given point. **Clamp and tangent screw** with counter spring to level bar. **Four Leveling Arms**. Weight of level without tripod about 5 lbs.

Instrument complete, in finely polished box, with plumb bob, adjusting pins, metal trivet (shown on page 252), book of instructions and tripod No. 7420.....each, \$57.50

 **OUR IRON CLAD GUARANTEE**, see page 196.

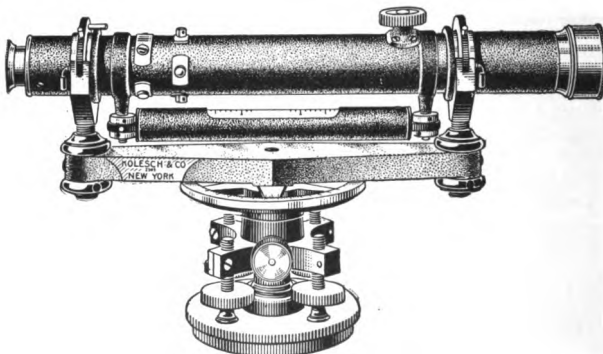
Kolesch Builders' Level No. 7860



7860 "Builders" Level, designed especially for the use of Builders, Architects and Contractors for leveling and plumbing walls, giving lines and levels for buildings, laying out angles, grading streets, sewers, drains, etc.

Telescope about 12 inches long, magnifying power 19 diameters. **Lenses** of the very best domestic make. Objective $1\frac{1}{8}$ inch. Dust Cap and Sun Shade. Rack and pinion movement to objective. Adjustable eye-piece for focussing cross hairs. **Fine bubble** ($4\frac{1}{4}$ inch vial) of **60 seconds** sensitiveness, graduated on the glass, attached to the telescope. Improved device for locking the clips in the Y's. **Horizontal circle**, 3 inches, divided to degrees reading by a vernier, attached to the spindle, to 5 minutes. This circle is held in place by a friction clutch and can be set at zero at any given point. Clamp and Tangent Screw with counter spring to level bar. **Four Leveling Arms**. Weight of level without tripod about 5 pounds.

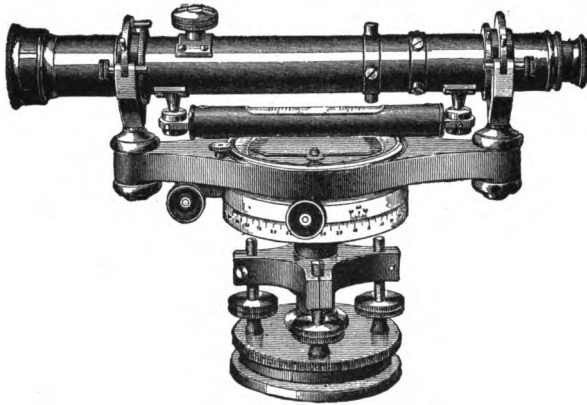
Instrument complete, in finely polished box, with plumb bob, adjusting pins, metal trivet (shown on page 252), book of instructions and tripod No. 7420each, \$45.00



7865 "Builders" Level, general description same as No. 7860, but without tangent screw. Complete with tripod No. 7420...each, \$40.00

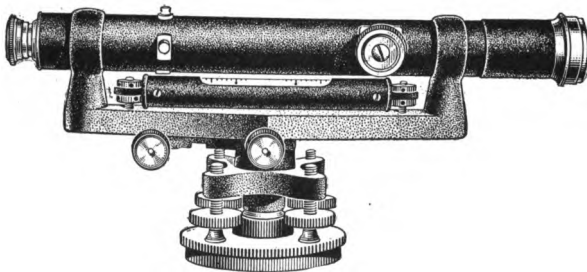
 **OUR IRON CLAD GUARANTEE**, see page 196.

Kolesch "Builders" Level with Compass, No. 7870



- 7870 Builders' Level, with Compass.** General description same as No. 7860, but with compass divided on raised ring to degrees and with improved needle $2\frac{3}{4}$ in. Weight without tripod about 6 lbs. Complete in finely polished box, with plumb bob, adjusting pins, metal trivet (shown on page 252), book of instructions and tripod No. 7420each, \$62.50

Kolesch "Builders' Dumpy" Level, No. 7880

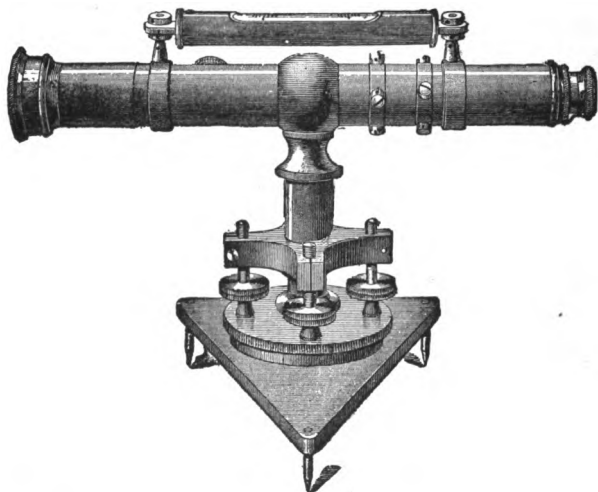


- 7880 Builders' "Dumpy" Level,** for builders, architects and contractors. Telescope 12 inches long, magnifying power about 19 diameters. Objective $1\frac{1}{8}$ in. Dust cap and sun shade. Rack and pinion movement to objective. Adjustable eye-piece for focussing cross-hairs. Fine bubble ($4\frac{1}{2}$ in. vial) of **60 seconds** sensitiveness, graduated on the glass attached to the telescope bar. Telescope bar and rings of an improved construction designed to produce a very strong instrument, which is not liable to get out of adjustment under the most severe conditions. Clamp and tangent screw. Weight of level without tripod about 5 lbs. Complete in finely polished box, with plumb bob, adjusting pins, metal trivet (shown on page 252) and tripod No. 7420 each, \$40.00

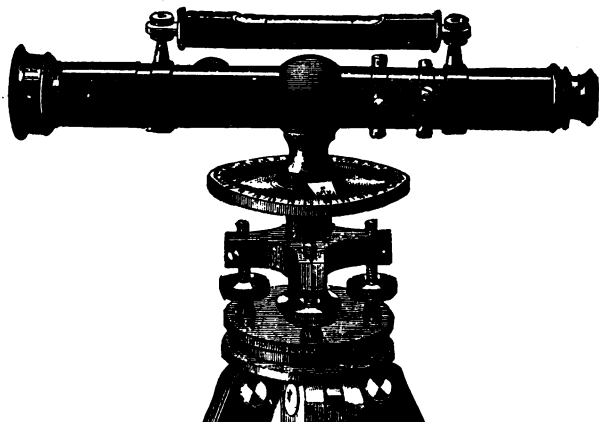


Dumpy Level.

The following instruments are of very simple construction, but, like the Architects' and Builders' Levels shown on the preceding pages, are well made, accurate leveling instruments, and will be found of great value to the builder, bricklayer, wheelwright, farmer, landscape gardener, etc.

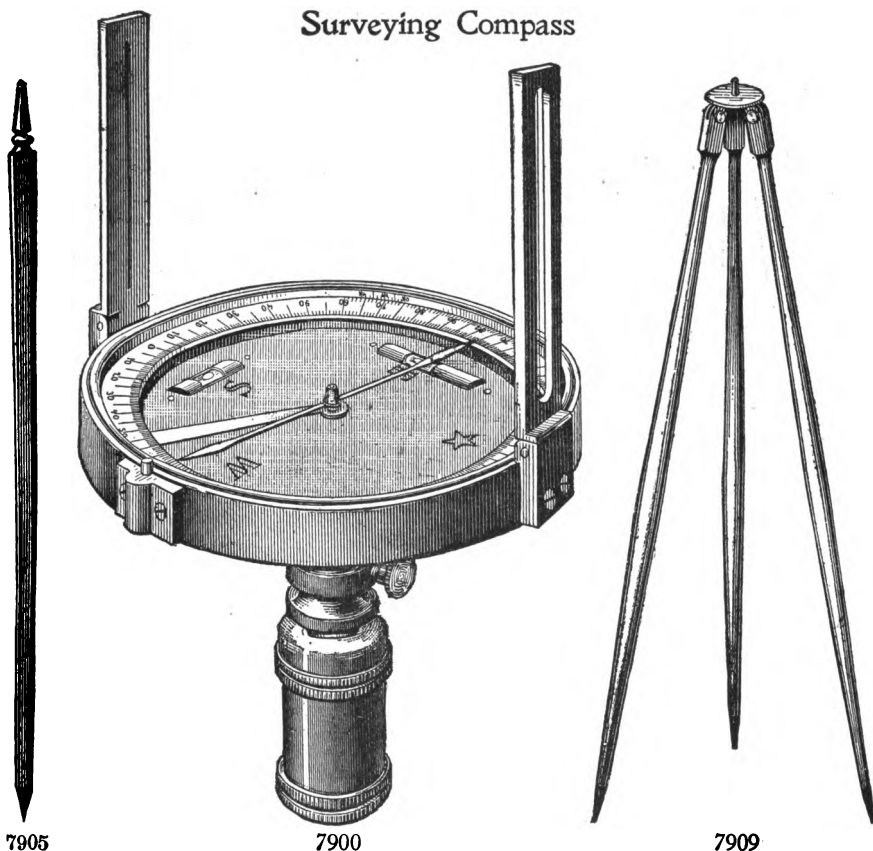


- 7885 Dumpy Level.** Telescope about 12 in. long, with adjustable eye-piece for focusing cross hairs, rack and pinion movement for focusing objective, dust cap, sun shade, graduated bubble to telescope. Complete in neatly polished box, with plumb bob, adjusting pins, hardwood tripod and metal trivet, each, \$35.00

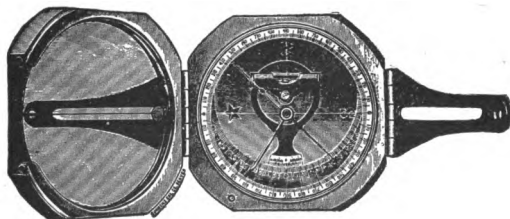


- 7890 Dumpy Level.** Telescope about 12 in. long, with adjustable eye piece for focusing cross hairs, rack and pinion movement for focusing objective, dust cap, sun shade, graduated bubble to telescope; horizontal circle 3 inches, divided to degrees, reading by a vernier (which is attached to the spindle) to 5 minutes. Horizontal circle is reversible for the purpose of setting the instrument at zero at any given point. Complete in neatly polished box, with plumb bob, adjusting pins, hardwood tripod and metal trivet (shown in cut above)...each, \$40.00

Surveying Compass



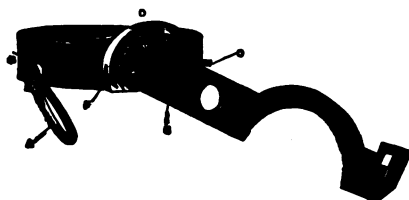
- | | | |
|------|--|---------------|
| 7900 | Surveying Compass, 4 inch needle, with folding sights, raised ring, graduated to degrees, variation plate (regulated by means of a pinion with capstan head), two level bubbles, ball joint and socket for mounting, in polished mahogany case | each, \$18.00 |
| 7905 | Jacob Staff, 54 inch, hardwood, iron shoe..... | 1.00 |
| 7907 | Tripod, hardwood, with wooden staff socket for No. 7900 .. | 3.00 |
| 7909 | Tripod, hardwood, with staff head of brass, for No. 7900.. | 5.00 |



- | | | |
|------|---|---------------|
| 7915 | Brunton's Pocket Transit, weight 8 oz., with directions.... | each, \$22.50 |
| 7916 | Leather Sling Case for No. 7915..... | 2.25 |



Verschoyle Pocket Transit.



- A. Thumb Loop.
- B. Clamp for lifting the needle from contact with jewel when instrument is not in use.
- C. Press Pin, for bringing the needle to rest quickly when taking an observation.
- D. Face of Prism Box, showing aperture leading to compass and sight.
- E. Back of Prism Box, showing extension of back sight aperture.
- F. Graduated Vertical Arc.

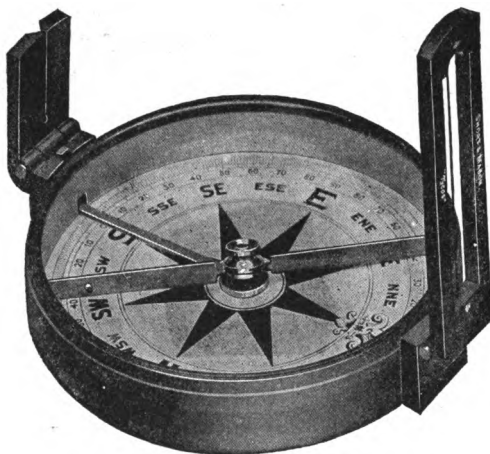
This instrument was designed by a mining engineer of practical experience, and has met a ready sale among mining engineers and others who want a light, portable instrument for preliminary surveys. Its distinguishing feature is that, owing to its novel construction, only one observation is necessary to obtain both the magnetic bearing and the vertical angle of any distant point. It is also specially adapted for use in difficult positions, such as are always liable to occur in filling in the rougher details in a mining survey. For rapid topographical work and working in constrained positions, the fact that half the labor is saved should be of interest to those who have to use this class of instrument. Another important point is that its efficiency is not determined by the length of the diameter of the compass, as is the case with the ordinary Prismatic Compass. With even a small instrument the same length of sight is obtained as with a 6" or 7" Prismatic Compass. It is constructed to withstand hard usage. The engineer himself can make all necessary adjustments, which is another point in its favor.

To use the instrument for obtaining horizontal and vertical angles after freeing the needle and unfolding the arm, grasp the compass box in the left hand, and then with the extended fingers of the right hand lightly grasp the arm and bring the distant target or light to the intersection of the cross lines at the end of the arm. When holding the arm firmly in that position, with the left hand slightly revolve the compass box until the small level bubble is seen through the prism to be at the central mark. The magnetic bearing will now be plainly visible in the prism at the same time that the target is viewed along the sight line, and the angle of depression or elevation is automatically recorded in the vertical arc. Both readings can then be booked at the same time without further observation. To use the instrument as a clinometer lay the bottom side of the arm on the object to be observed, and looking through the window at the top of the compass box slightly revolve the box until the small bubble comes to its center. The angle may then be read off the vertical arc. When not in use always throw the needle off the point by the means provided and fold up the arms.

- 7920** Verschoyle Pocket Transit, $3\frac{3}{8}$ in., aluminum case, needle $2\frac{1}{2}$ in., compass to $\frac{1}{2}$ degrees, vertical arc to degrees. Weight about $9\frac{1}{2}$ ounces. In leather sling case each \$35.00
- 7922** Same as No. 7920, but with angle piece and collapsible metal tripod, ball and socket fitting each 44.00

Sight Compasses

Made by Short & Mason, England.



- 7940 Sight Compass, bronzed metal case with cover, untarnishable silvered metal dial, tempered bar needle and folding sights:

	2	2½	3 inch
Each.....	\$6.00	\$7.20	\$8.75

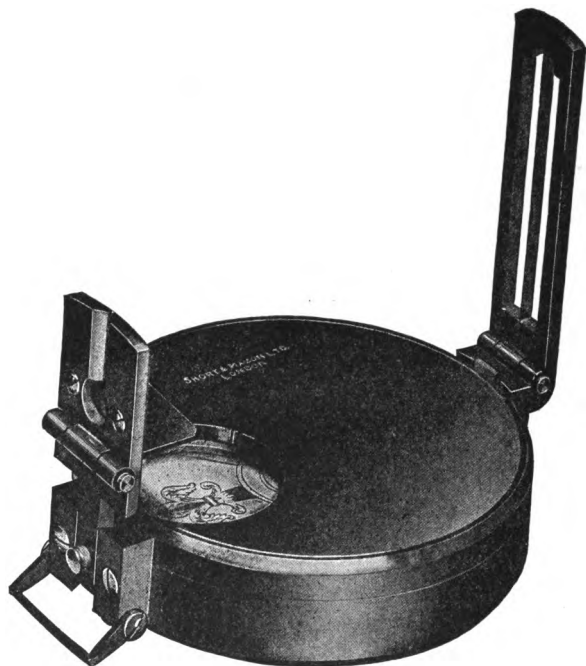


- 7942 Bridge Sight Clinometer Compass, 3 inch, can be used as a sight compass, or as a clinometer for taking angles of inclination. Bronzed case, silvered metal dial, hardened and tempered edge bar needle, jeweled center, in leather flap caseeach, \$10.75



Prismatic Surveying Compass

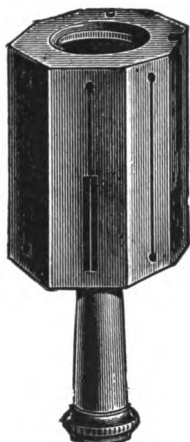
Made by Short & Mason, England.



- 7944 **Prismatic Compass**, 2 inch, card dial, jeweled center, folding sights, in morocco case.....each, \$15.50
- 7945 **Prismatic Compass**, 3 inch, card dial, jeweled center, folding sights, in solid leather sling case.....each, 19.50
- 7946 Same as No. 7945, with azimuth shades and mirrors, in solid leather sling case.....each, 26.00
- 7947 **Prismatic Compass**, 4 inch, card dial, jeweled center, folding sights, in solid leather sling case.....each, 23.25
- 7948 Same as No. 7947, but with azimuth shades and mirrors, in solid leather sling case.....each, 31.00
- 7949 **Metal Collapsible Tripod** for Prismatic Compasses Nos. 7944-7948, with ball and socket motion. Opens to 53 inch, closes to 16½ inch. Weight 2 lbs.....each, 13.50

Cross Staff Heads

Made by Short & Mason, England.

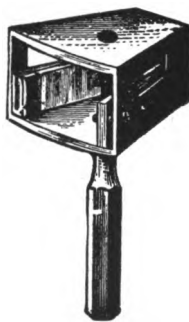


- | | | |
|------|---|--------|
| | | each. |
| 7956 | Cross Staff Head, $2\frac{1}{4}$ in., octagonal, with staff socket, in case.. | \$4.00 |
| 7957 | Cross Staff Head, $2\frac{1}{2}$ in., octagonal, with staff socket, in case.. | 5.50 |
| 7958 | Cross Staff Head, 3 in., octagonal, with staff socket, in case.. | 5.75 |

Angle Mirrors



7960



7962

- | | | |
|------|---|--------|
| | | each. |
| 7960 | Angle Mirror, for right angles, with small plumb bob, detachable handle, in case..... | \$7.50 |
| 7962 | Angle Mirror, for right angles, plain, in case..... | 5.00 |



Miners' Compass or Dipping Needle

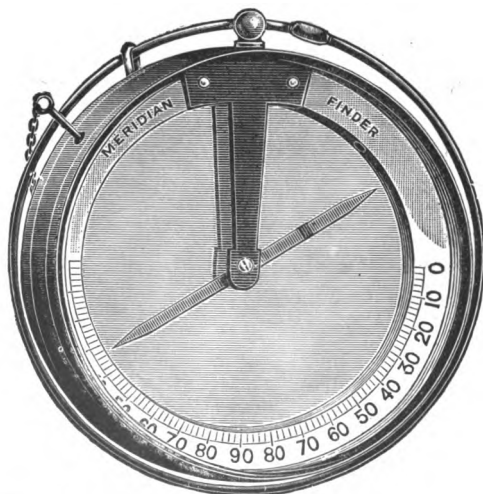
Made by Short & Mason, England.



In the hands of the prospector the Miners' Compass or Dipping Needle proves a serviceable guide to the discovery and location of magnetic iron ore. In this instrument the magnetic needle is carefully balanced upon a horizontal axis within a graduated circle, and in which the needle will be found to assume a position inclined to the horizon. This angle of deviation is called the inclination or dip, and varies in different latitudes, and even at different times in the same place. Hence, in reading the needle for the suspected presence of magnetic iron ore, the observer must not only be governed by his instrument, but must also draw into requisition his knowledge of the general geological formation of the place of his survey; and depending on his experience,

he will be enabled to approximate as to the probable mass and the depth of the ore from the surface. When used for tracing ore the observer should hold the ring in his hands and keep the needle north and south, standing with his face to the west. The inclination of the needle as read off on the graduated scale will show the dip. If the compass is held horizontally it serves as an ordinary compass.

- 7965** Dipping Needle, 3 inch, Norwegian pattern, needle gimballed having a motion in azimuth as well as in altitude, in velvet lined caseeach, \$20.00

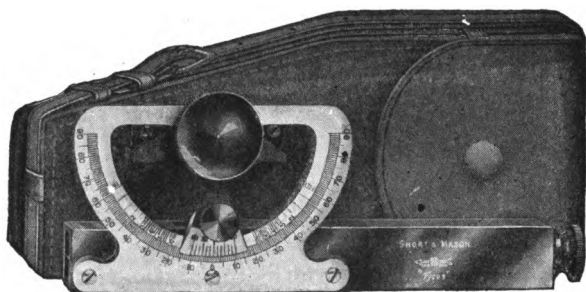


- Dipping Needle, 3 inch, in velvet lined case.....each, \$12.00

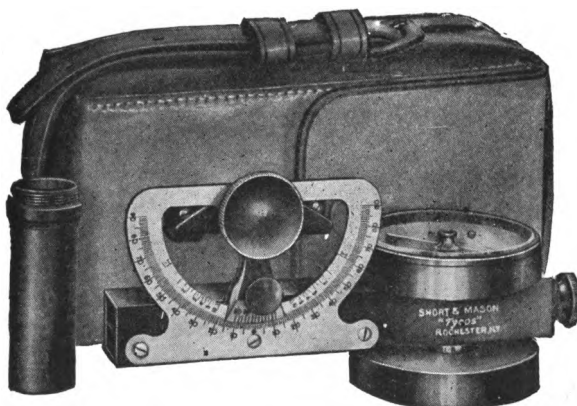
Abney Hand Levels

Made by Short & Mason, England.

For obtaining the height of buildings, trees or any other object, also for setting out gradients for railway, drainage or mining purposes.

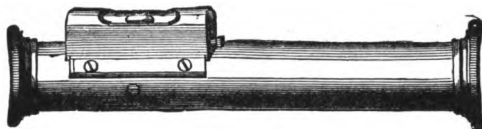


- 7970 **Abney Hand Level**, 5 inch, German Silver Arc with vernier reading to 10', clamping device to vernier and draw telescope, in leather sling case.....each, \$15.00

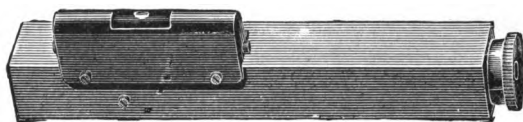


- 7972 **Abney Hand Level**, 5 inch, with circular rotating base, German Silver Arc with vernier reading to 10', clamping device to vernier, draw telescope, compass with bar needle, and staff socket, in leather sling case.....each, 24.00

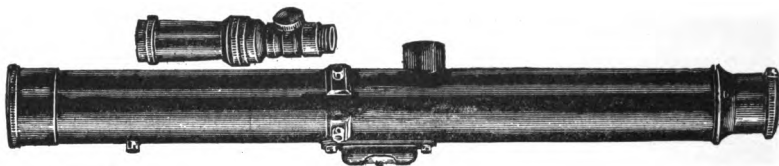
Hand Levels



- each.
7975 Locke's Hand Level, 5 in. long, German silver, in leather case, \$7.50
7977 Locke's Hand Level, 5 in. long, nickel plated, in leather case.. 5.90
7979 Locke's Hand Level, 5 in. long, bronzed, in leather case..... 5.00

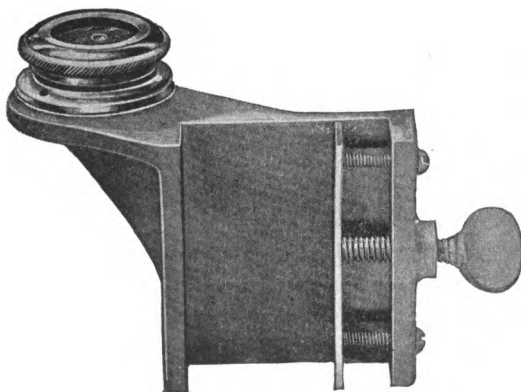


- 7980** Square Hand Level, in leather case.....each, \$4.00



- 7982** Stadia Hand Level, 10 in., fixed stadia hairs, aperture of object glass, 1 in., with ball and socket joint, in leather sling case.....each, \$18.00

Rod Level



A convenient tool for determining whether the rod is held in a perpendicular position. Can be clasped against the rod by holding the two in the hand, or can be attached to the rod by a screw provided for this purpose.

- 7985** Rod Level, metal, round level vial, 1 inch in diameter.
 Each \$3.00

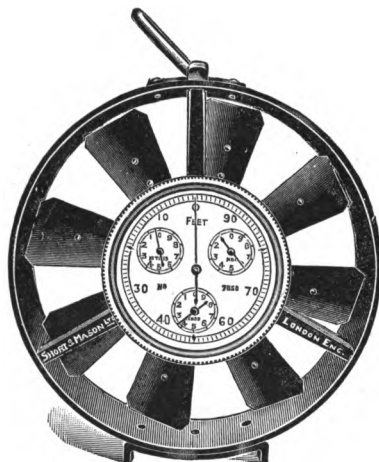
Anemometers or Air Meters

Made by Short & Mason, England.

Biram's Pattern.

For registering the velocity of air currents in mines, tunnels, flues of furnaces, sewers, shafts, etc.

With jeweled movements, zero setting device and chart of corrections.



		In Leather Case	In Leather Sling Case
8054	Biram's Anemometer, 3 inch, 2 dials reading to 1,000 feet	\$25.00	
8055	Biram's Anemometer, 4 inch, 4 dials reading to 100,000 feet	28.00	\$32.75
8056	Biram's Anemometer, 6 inch, 4 dials reading to 100,000 feet	35.00	40.75
	No. 8054 will stand a pressure of 1,000 feet per minute.		
	Nos. 8055 and 8056 will stand a pressure of 3,000 feet per minute.		

High Speed Anemometers

Constructed for very strong blasts up to 8,000 feet per minute.

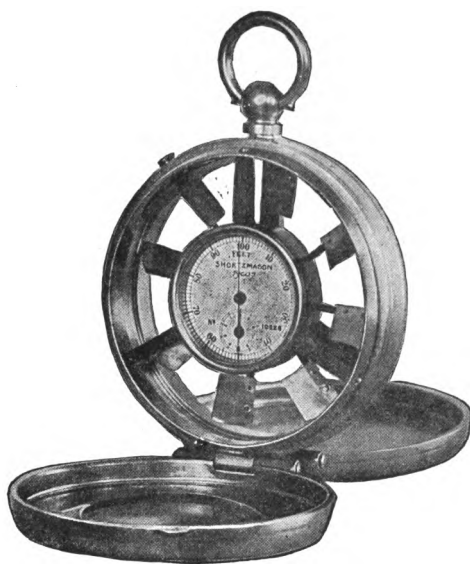
- 8058 High Speed Anemometer, 3 dials, similar to above, registering to 200,000 feet, with disconnecter and zero setting attachment, in leather case, with chart of corrections..each, \$45.00

Anemometers not guaranteed accurate when used in a temperature exceeding 300° Fahrenheit.

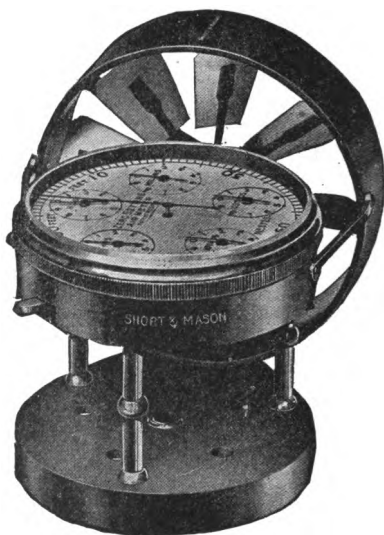


Anemometers or Air Meters—Continued

Made by Short & Mason, England.



8061



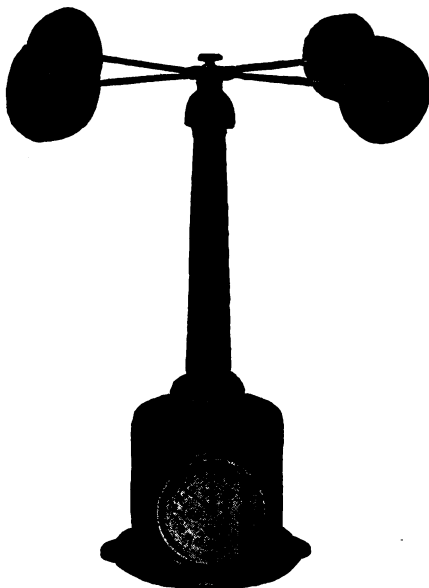
8063

- 8061 Biram's Pocket Anemometer.** Extra strong construction, 2 inch. Two dials reading to 1,000 feet. Weight $5\frac{1}{2}$ ounces. In leather case.....each, \$40.00
- 8063 Portable Anemometer,** $2\frac{1}{2}$ inch, 4 dials reading to 100,000 feet, with disconnector and zero setting device, in case....each, 30.00
- 8064** Same as No. 8063, but 6 dials reading to 10,000,000 feet..each, 30.00
Sand Glass Timers attached to Nos. 8063 and 8064....extra, 3.75

Anemometers or Air Meters

ROBINSON'S IMPROVED PATTERN.

Made by Short & Mason, England.



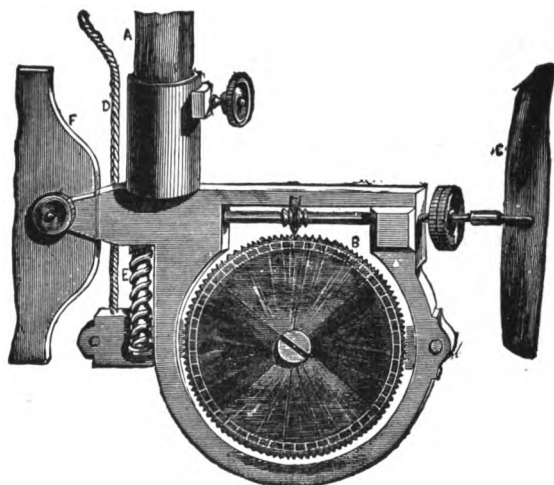
The improvement consists, first, in a rearrangement of the works which admits of the column carrying the arms and cups, rising from the *center* of the base, and secondly, an arrangement by which the enumeration is affected by two hands which can be set to zero on the commencement of an observation, thus obviating the necessity of taking a reading of the dials before proceeding to make a fresh observation.

Another improvement is the recent introduction of ball-bearings to the central shaft by which the friction is reduced to a minimum and the wearing of the instrument prevented.

8071 Robinson's Anemometer as above, with 3 inch cups, reading to 500 miles, complete.....each, \$45.00



The Portable Current Meter.



This instrument is constructed and used for the measurement of *rate* or *flow* of small rivers and streams, also for the flow of *tides*.

For this purpose the meter should be placed in the stream, as per directions supplied, and allowed to run for a given time. The rate of the stream per unit time is then shown by reference to the graduations of the circles which are actuated by the force of the water upon the Fan-screw. The value of the graduation is as follows:

1. The inner circle, graduated to show 8 miles in a revolution.
2. Each mile, subdivided into 8 parts, showing *furlongs*.
3. Each furlong graduation, subdivided into 3 parts, equal to 220 feet each.
4. The outer circle, graduated to show *single feet*, and a complete revolution 220 feet.

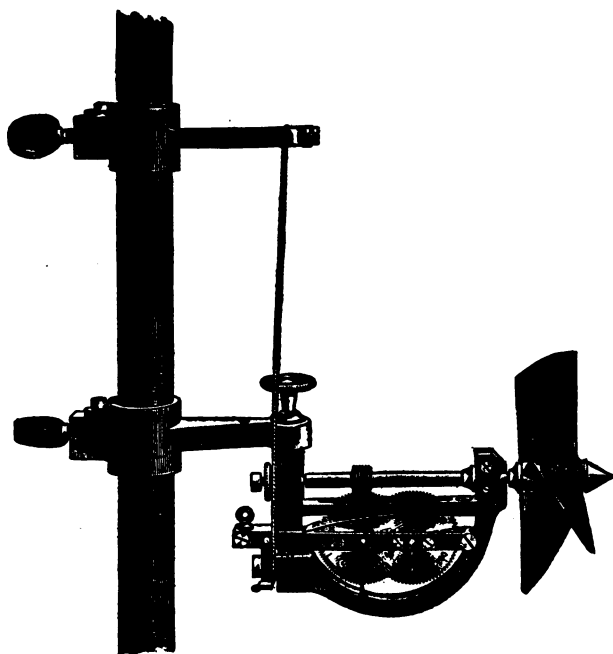
The circles *B* are attached to a movable arm, which throws the endless screw in or out of gear. This arm can be raised by turning the screw which passes through the coil spring *E*, which would fix the gearing for constant use. It can also be raised by pulling the cord *D* after the meter is submerged in the stream at the instant of a given time, and also released at the expiration of the given time.

The meter can also be used for determining the *quantity* of water flowing from a reservoir or tank.

For this purpose, it is necessary to know accurately the area of the channel or tube through which the water is passing and the meter to be placed within it. Then the volume of water passing per minute is shown in cubical feet by multiplying or dividing (according to area of-tube) the area of the tube by the rate per minute as shown by the meter.

8078 Portable Current Meter, complete, in mahogany case.....each, \$55.00

Current Meters—Continued



- 8081** Current Meter, with 2 graduated wheels registering to 1,000 revolutions, with eccentric lever, operated by strings, for engaging or disengaging. Propeller, 5 in. diameter, with agate and ball-bearing axis. Detachable metal rudder, 7x3 inches. Can be attached to any convenient pipe or pole about 1 inch diameter and fastened on same, either in a fixed or a swiveling position, by means of the set screws. In finely polished wooden case.....each, \$77.00
- 8083** Current Meter, pocket size; similar in construction to No. 8081, but with propeller, 3 inches diameter, and without rudder; size of pole required about $\frac{3}{4}$ inch diameter; in morocco case, 9x4x1 $\frac{1}{2}$. Small, neat and compacteach, \$45.00



Rain Gauges

Made by Short & Mason, England.

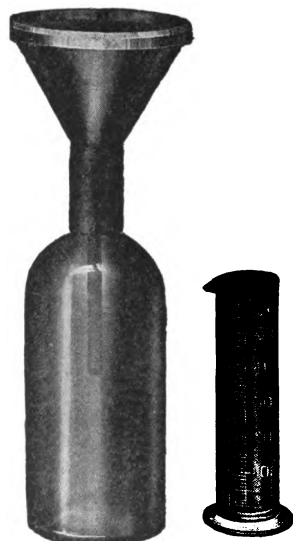


8086 Selfregistering Rain Gauge, 2 dials, zero setting, registers 1/100 of an inch up to 12 in. In japanned metal case, 8x10, with directions.....each, \$30.00

8087 Same as No. 8086, but in copper case.....each, 37.00



8091



8098

8091 Glaisher's Rain Gauge, japanned metal receiver, 8 inch diameter, funnel with brass rim terminating in curved tube which prevents evaporation by retaining a small portion of water. Receiver is sunk into the ground within 8 in. of the top, preventing all evaporation even in the warmest season... each, \$7.50

8093 Same as No. 8091, made of copper with brass rim.....each, 15.25

8098 Howard's Rain Gauge, glass bottle with japanned funnel with brass rim, 5 inch diameter, graduated glass measure to show .01 of an inch of rainfall.....each, 3.25

8099 Same as No. 8098, but with copper funnel with brass rim.....each, 4.65

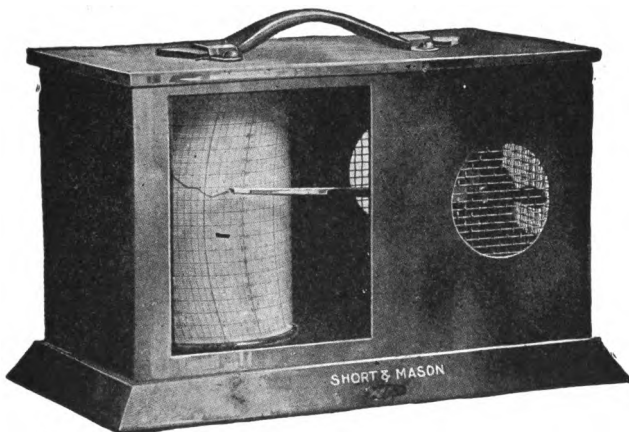
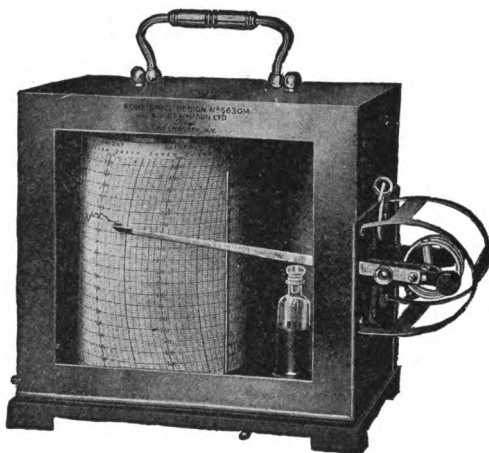
Extra Graduates reading to .01 for Nos. 8091 and 8093..each, 2.00

Extra Graduates reading to .01 for Nos. 8098 and 8099..each, 1.00

Thermograph or Recording Thermometer

Made by Short & Mason, England.

- 8101 Thermograph.** Cast metal base, hinged copper lid. Exposed lamina insuring perfect circulation of air around it, being sufficiently distant from the case as to be unaffected by the metal. With patent clock and 6 inch certified thermometer for purpose of comparison. Furnished with charts not figured and can be supplied with charts figured for 75°, 150° or 300° F. range....each, \$50.00



- 8103 Thermograph,** with iron base and copper hinged case. High drum. With 8 day cylinder clock with charts ranged from -62° to +128° F. With recording lamina inside. Can be supplied with charts showing ranges of 75°, 150° or 300° F. With certified thermometereach, \$50.00

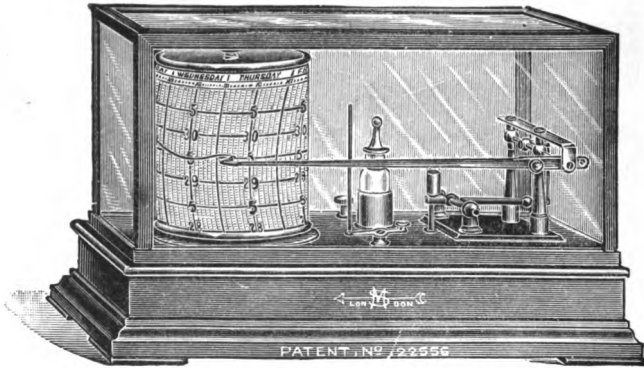
Pocket Thermometers

- 8105** Pocket Thermometer, in polished case, $4\frac{1}{2} \times 1\frac{1}{4}$ in.....each, \$1.75
8107 Pocket Thermometer, 5 inches long, in rubber case..... " .85
8109 Pocket Thermometer, 4 inches long, in metal case..... " .50

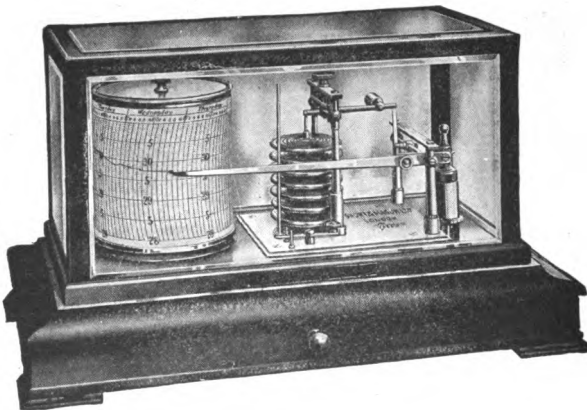


Stormograph or Recording Barometer

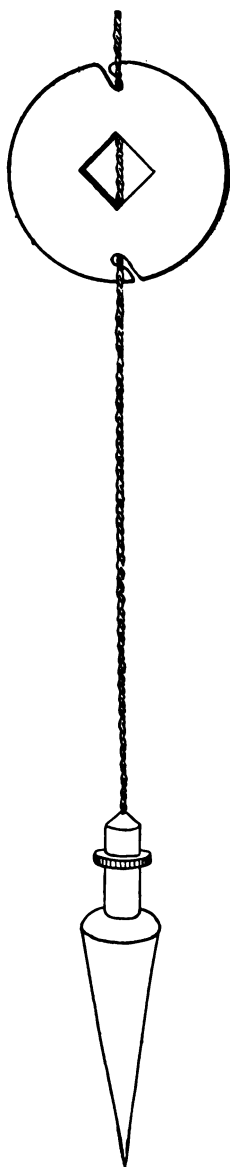
Made by Short & Mason, England.



- 8110 Stormograph.** Simplified in form, in glass case with metal frame. With clockwork revolving the drum and charts one complete revolution in seven days. The barometrical changes are effected by a large vacuum pan concealed in the base of the instrument. Complete with charts...each, \$40.00



- 8111 Stormograph,** in metal frame, with beveled plate glass top and sides. Drawer for holding used and unused charts. Complete, with seven day clock and charts.....each, \$63.00



"Fulton" Pocket Target

(Patented)

Illustration $\frac{1}{2}$ size.

A handy and useful article for locating or sighting the line from which the plumb bob is suspended over a given point. Made of White Celluloid on one side and red on the other, circular in form with a diamond-shaped cut out which offers a strong contrast against the white body of the target and through which the plumb bob line is easily sighted from the instrument at very long distances.

Convenient to carry in the pocket, readily attached or detached by means of the slots (see cut) and can be easily raised or lowered at will.

Will be appreciated when sighting in dark or shady places or towards dusk when the light is failing. In such cases a lighted match held behind the cut out will enable the transit man to quickly locate the line.

Useful in crowded city streets where the operator can, without any effort, hold the target over the heads of passing pedestrians who are liable to obstruct the view.

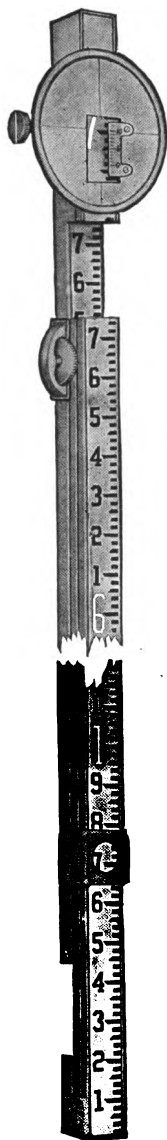
Extremely serviceable for use in the country where sights are constantly taken with shrubs or foliage as a background making the plumb bob line indiscernible at long distances.

More convenient and more accurate than a flag or sighting pole with its accompanying "waving of the pole" to set same plumb.

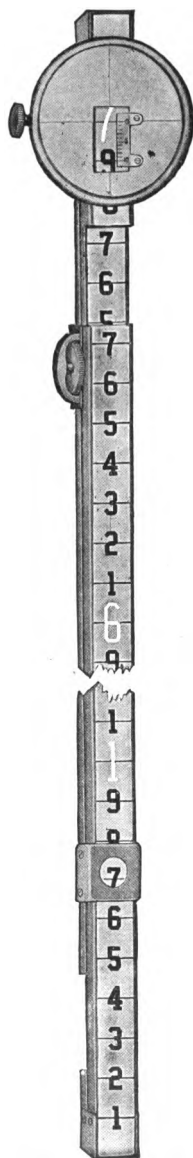
8115 "Fulton" Pocket Target, $2\frac{1}{2}$ in. diameter...per doz., \$2.50 each, \$.25



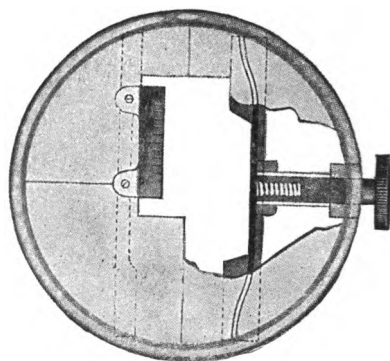
Philadelphia Leveling Rods, Improved Construction



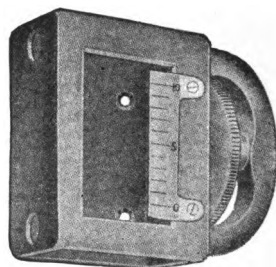
Nos 8117-8124



Nos. 8129-8134



Front Target



Rear Target

For description and prices see opposite page.

Philadelphia Leveling Rods

Improved Construction.

Made from selected quarter sawed maple, carefully air seasoned and kiln dried. Prepared with five coats of pure white, weatherproof paint which will not turn yellow with age. The graduations are stamped with steel dies by a machine which stamps ten feet at one impression, thereby insuring great accuracy. After being graduated the rods are finished with four coats, rubbed, of the highest grade of weatherproof transparent varnish.

The front targets are made of hard cast bronze and equipped with an improved screw which cannot be lost. The screw is threaded on the inside and sets over the lug attached to the brass clamping spring, which is also threaded. A sleeve riveted to the target screw, between the ribs on the back of the target, prevents any lateral motion and makes it impossible to lose the screw.

The rear targets are provided with a large thumb screw which tightens the clamp spring on the inside and is threaded into the body of the target. This gives a very quick and positive clamp and does away with the possibility of losing or bending the screw.

DIVIDED: Feet, 10ths and 100ths; Vernier reading to 1,000ths.

Figures for the 10ths are 5/100ths high:

8117	Heavy Philadelphia Rod, 7 ft. extending to 13 ft.....each,	\$15.00
8119	Light Philadelphia Rod, 6½ ft. extending to 12 ft.....	" 13.00
8121	Trolley Size Philadelphia Rod, 5 4/5 ft. extending to 10½ ft.....	" 13.00
8123	Mining Philadelphia Rod, large, 5 ft. extending to 9 ft....	" 12.00
8124	Mining Philadelphia Rod, small, 3 ft. extending to 5 ft....	" 11.40

DIVIDED: Feet and 10ths; Vernier reading to 100ths.

Figures for the 10ths are 6/100ths high and the lines of the figures 1/100th wide. The rod can therefore be read to 1/100ths without using the vernier.

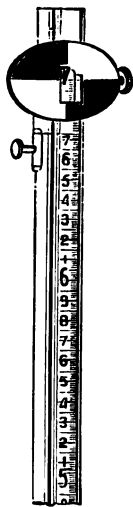
8129	Heavy Philadelphia Rod, 7 ft. extending to 13 ft.....each,	\$15.00
8131	Light Philadelphia Rod, 6½ ft. extending to 12 ft.....	" 13.00
8133	Mining Philadelphia Rod, large, 5 ft. extending to 9 ft....	" 12.00
8134	Mining Philadelphia Rod, small, 3 ft. extending to 5 ft....	" 11.40

Separate Targets for Above Rods.

8143	Front Targets for Philadelphia Rods.....each,	\$5.00
8144	Rear Targets for Philadelphia Rods.....	" 2.50

For additional rods see following pages.

Leveling Rods—Continued



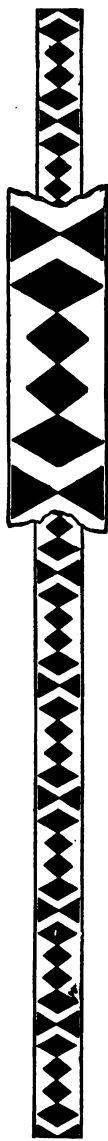
8158



8161



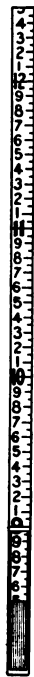
8163



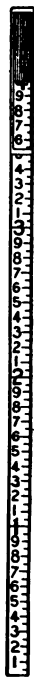
8180



8182



8218



Leveling Rods—Continued

- 8158 **"California" Leveling Rod**, engine divided, with target, vernier, and clamp, 7 ft. long, extending to 13 ft. Divided to feet, 10ths and 100ths, with vernier reading to 1,000ths. Divisions are thin black lines (engine divided) on a white painted background, allowing a very accurate reading of the 100ths and a corresponding accuracy in reading the vernier.....each, \$15.00
- 8161 **"New York" Rod**, with target, vernier and clamp, 6½ ft. long, extending to 12 ft. Divided to feet, 10ths and 100ths, with vernier reading to 1,000ths.....each, 14.00
- 8163 **"Boston" Rod**, mahogany, with clamp and target, vernier at both ends. Divisions are engine divided on boxwood inlaid on the mahogany stock. 6½ ft. long, extending to 11 ft., each, 14.00
- 8165 **"Stadia" Rod**, designed by Lieut. Alfred G. Noble, U. S. A., one of the pioneers in the use of the Stadia Rod, and used by him in the construction of the N. Y. State Barge Canal. Made of hardwood, 6 ft. long, opening to 12 feet. With strong hinge and brace to hold in position when opened.....each, 9.00

Metric Rods

- 8171 **Metric Rod**, similar to No. 8131, 2 meters long and extending to 3.7 meters.....each, 13.00
- 8173 **Metric Rod**, similar to No. 8129, 2.2 meters long, extending to 4 meters.....each, 15.00

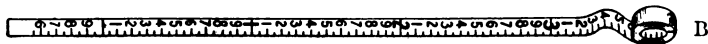
Builders' and Architects' Rods

- 8180 **Builders' Rod**, maple, with target, vernier and clamp. 5 ft. long, extending to 10 ft. Divided to feet, inches and 8ths, with vernier reading to 64thseach, 6.00
- 8182 Same as No. 8180, but divided to feet, 10ths and 100ths, with vernier reading to 1,000ths.....each, 6.00

Chicago Leveling Rods

- 8216 **Chicago Leveling Rod**, Style A, divided to feet, 10ths and 100ths. In three sections. Nickel plated socket constructed so as not to obstruct the view. Graduations painted on the rod. In canvas sack. Length, 12½ feet..... 11.25
- 8218 **Chicago Leveling Rod**, Style B. Divided to feet and 10ths, otherwise same as No. 8216..... 11.25
- 8220 **Chicago Leveling Rod**, Style C. Divided to feet, inches and 8ths, otherwise same as No. 8216..... 11.25

Chicago Rod Ribbon



Made of Paper Cloth, can be folded up and carried in the pocket. For use they are attached to any convenient strip of wood.

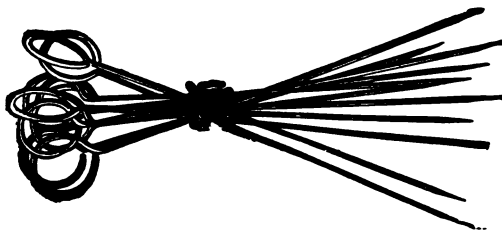
- 8232 **Style A** }
 8234 **Style B** } in lengths of 12½, 16½ and 20½ feet.....per foot, \$.10
 8236 **Style C** }



Ranging or Flag Poles

- 8302** Ranging Poles, of best seasoned wood with metal shoe. Octagonal, tapered, painted red and white alternately every foot.
- | | | | |
|-----------|--------|------|-------------|
| | 6 | 8 | 10 ft. long |
| Each..... | \$2.00 | 2.25 | 2.50 |
- 8303** Ranging Poles. **Tubular Iron.** $\frac{7}{8}$ in. diameter, painted red and white, alternately every foot.
- | | | | |
|-----------|--------|------|-------------|
| | 6 | 8 | 10 ft. long |
| Each..... | \$2.75 | 3.00 | 3.50 |
- 8304** Ranging Poles. **Solid Steel.** Octagonal, $\frac{1}{2}$ in. diameter, painted red and white, alternately every foot. The points are hardened and drawn out of solid steel.
- | | | |
|-----------|--------|------------|
| | 6 | 8 ft. long |
| Each..... | \$2.75 | 3.00 |
- 8306** Sectional Ranging Poles, **Tubular Iron,** $\frac{7}{8}$ in. diameter. **In 2 sections.** Painted red and white alternately every foot.
- | | | | |
|-----------|--------|------|-------------|
| | 6 | 8 | 10 ft. long |
| Each..... | \$4.50 | 4.75 | 5.00 |
- 8310** **Chicago Ranging Pole.** Wood, 8 ft. round, $1\frac{1}{16}$ in. diameter. **In 2 sections** jointed with telescope tubing and held together by a spring clip. Brass shoe and metal tip. Painted red and white alternately every foot. With strong cloth sack with 2 pockets.....each, \$3.00
- 8312** **Chicago Ranging Pole.** $7\frac{1}{2}$ ft. long, round $\frac{5}{8}$ in. diameter. **In 3 sections.** Weight 2 lbs. Made of brass tubing with telescope joints and steel tip. Painted red and white, alternately every 6 inches. **In 3 pocket sack**each, \$3.00

Arrows, or Marking Pins



- 8320** Steel Arrows, **extra quality, heavy, hardened points which will not bend,** WG 6, 10 inches long:
- | | | | | | |
|--------------|--------|-------------|--------|-------------------|--------|
| Per 100..... | \$9.00 | per 50..... | \$5.00 | per set of 11.... | \$1.25 |
|--------------|--------|-------------|--------|-------------------|--------|
- 8322** Steel Arrows, same as No. 8320, 14 inches long:
- | | | | | | |
|--------------|---------|-------------|--------|-------------------|--------|
| Per 100..... | \$10.00 | per 50..... | \$6.00 | per set of 11.... | \$1.50 |
|--------------|---------|-------------|--------|-------------------|--------|
- 8324** Steel Arrows, medium WG 9, 11 in set:
- | | | | |
|--------------|--------|--------|----------------|
| | 14 in. | 12 in. | 10 inches long |
| Per set..... | \$1.00 | .90 | .80 |
- 8326** Iron Arrows, WG 9, 11 in set, 14 inches long.....per set, \$.60
- 8328** Chicago Arrows, hardened steel, $\frac{3}{16}$ in. diameter, 14 in. long. Japanned red and white alternately every inch. Easily seen in the grass or bushes.
- | | |
|---------------------|--------|
| Per set of 11 | \$1.50 |
|---------------------|--------|
- 8329** Quiver for carrying arrows No. 8328.....each, .60

Brass Plumb Bobs and Sheaths



8330 and 8331



8340

8330 Brass Plumb Bobs, I quality, long necks, hardened steel points and screw caps.

	4	8	12	14	16	18	24	32	48	80 oz.
Per doz.,...	\$12.50	16.00	20.00	22.50	25.00	27.50	32.50	37.50	50.00	85.00
Each.....	1.25	1.60	2.00	2.25	2.50	2.75	3.25	3.75	5.00	8.50

8331 Brass Plumb Bobs, II quality, sizes and styles same as No. 8330.

	8	12	14	16 oz.
Per dozen.....	\$10.00	12.50	15.00	17.50
Each.....	1.00	1.25	1.50	1.75

8332 Adjustable Brass Plumb Bob, 10 oz., with concealed reel...each, \$2.50

8334 Plain Brass Plumb Bobs, with steel points.

8 oz..per doz., \$7.50 each, \$.75 12 oz..per doz., \$12.00 each, \$1.20

Plumb Bob Sheaths

8340 Plumb Bob Sheath, of sewed sole leather, for carrying plumb bobs. With loop for attaching to belt, No. 8418.

Sizes.....	4-8 oz.	12-14 oz.	16-24 oz.	32-48 oz.	80 oz.
Each.....\$	.35	.45	.55	.75	1.00

(Continued on next page.)

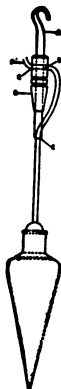


Plumb Bobs—Continued

8345



8365



- 8345 Miners' Plummet Lamp, 6½ in. (weight about 20 oz.), made of brass with steel point; hung in gimbals, with chains for suspending. Upper part is hollow and provided with an oil burner serving as a lamp. Sight is taken to the center of flame.....each, \$10.00
- 8346 Two Miners' Plummet Lamps, No. 8345, in finely polished boxcomplete, 18.00
- 8347 Tripod (No. 7420), with standard for suspending Miners' Plummet Lamp, No. 8345.....each, 15.00
- 8348 Extension Tripod (No. 7415), with standards for suspending Miners' Plummet Lamp, No. 8345..... " 21.00

Mercury Plumb Bobs

- 8350 Mercury Plumb Bob, 3½ oz., 4 in. long, ⅝ in. diameter..each, \$1.00
- 8352 Mercury Plumb Bob, 6 oz., 4½ in. long, ⅝ in. diameter.. " 1.50
- 8354 Mercury Plumb Bob, 12 oz., 5⅜ in. long, ⅞ in. diameter.. " 2.00
- 8356 Mercury Plumb Bob, 16 oz., 6 in. long, 1 in. diameter.. " 2.50

Plumb Bob Line

- 8360 Plumb Bob Line, best braided linen. In skeins of 25 yards per dozen.....\$3.00 per skein..... \$.30
- 8362 Plumb Bob Line, braided silk. Per skein of 25 yards..... 1.25

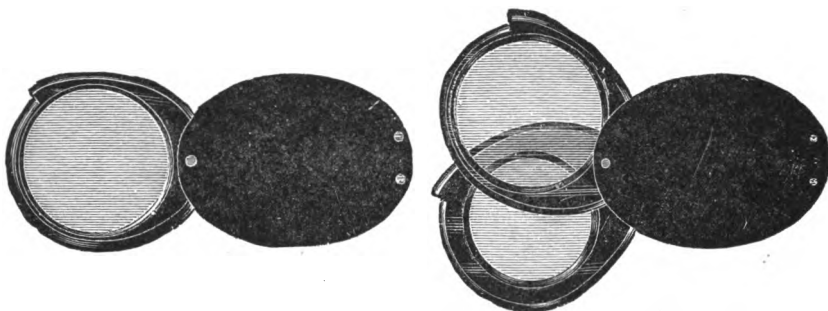
Plumb Bob Adjuster

- 8365 Plumb Bob Adjuster, brass, with directions.....each, \$.35
- This convenient little tool is intended to overcome the difficulties generally found in adjusting the length of the line which holds the plumb bob. Can be attached to any transit or level. The weight of the bob holds same in place at any desired distance. No tying of knots necessary.

Repairs of Plumb Bobs

- Sharpening points of plumb bobs.....each, \$.35
- Inserting new steel points and truing up..... " .50
- Extra steel points for plumb bobs, not fitted.
- | | | | |
|-----------|----------|-----------|-----------|
| | 4-14 oz. | 16-32 oz. | 48-80 oz. |
| Each..... | \$.25 | .50 | 1.00 |

Magnifying and Reducing Glasses



- | | | | |
|-------------|---|------|--------|
| 8370 | Pocket Magnifying Glasses, High Power, for reading verniers on surveying instruments. In White Celluloid Cases , which have the advantage of being easily found when dropped in bushes or grass:
$\frac{3}{4}$ inch diameter.....each, \$.60 1 inch diameter.....each, \$.70
<div style="text-align: right; margin-right: 100px;">1 inch 1½ inch</div> | | |
| 8371 | Pocket Magnifiers, black celluloid cases, 1 lens.....each, \$.35 | | \$.60 |
| 8373 | Pocket Magnifiers, black celluloid cases, 2 lenses " | .45 | .70 |
| 8375 | Pocket Magnifiers, in bronzed cases, 1 lens..... " | .55 | .95 |
| 8377 | Pocket Magnifiers, in bronzed cases, 2 lenses.... " | .90 | 1.30 |
| 8379 | Pocket Magnifiers, in bronzed cases, 3 lenses.... " | 1.35 | 1.70 |
| 8381 | Pocket Magnifiers, in nickel plated cases, 1 lens... " | .60 | 1.05 |
| 8383 | Pocket Magnifiers, in nickel plated cases, 2 lenses. " | 1.00 | 1.40 |
| 8385 | Pocket Magnifiers, in nickel plated cases, 3 lenses. " | 1.50 | 1.85 |



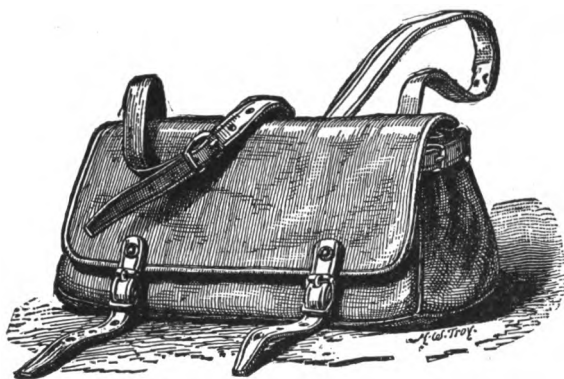
- | | | | | | | | |
|---------------------------------------|--|--------|--------|-----|------|------|---------------|
| 8390 | Reading Glasses, best quality, nickeled German Silver rims, polished ebonized handles. | | | | | | |
| | 2 | 2½ | 3 | 3½ | 4 | 4½ | 5 in. dia. |
| | Each | \$.55 | .75 | .95 | 1.25 | 1.65 | 2.10 2.50 |
| 8392 | Reducing Glasses, nickel plated frames, wooden handles. For reducing. | | | | | | |
| | | | 2½ | | 2¾ | | 3 in. dia. |
| | Each | | \$1.00 | | 1.25 | | 1.50 |
| 8394 | Reducing Glasses, unmounted, 1¼ in.....each, \$.20 | | | | | | |
| Special High Power Magnifiers. | | | | | | | |
| 8395 | Steinheil Magnifiers, brass japanned frames, 9/16 in., 7 power | | | | | | |
| | | | | | | | each, \$13.75 |
| 8396 | Steinheil Magnifiers, brass japanned frames, ¾ in., 10 power | | | | | | |
| | | | | | | | " 11.75 |
| 8397 | Five Power Magnifiers, ½ in. shell case, ordinary quality.. | | | | | | |
| | | | | | | | " 5.40 |

Surveyors' Bags

For Carrying Field Utensils, Such as Field Books, Tapes,
Plumb Bobs, Hatchets, Etc.



- 8401 "Field Book" Bag**, made of Heavy Russet Leather, carefully sewed. For carrying field books, tapes, etc., 8x10 inches with 2 pockets and shoulder strap.....each, \$2.50



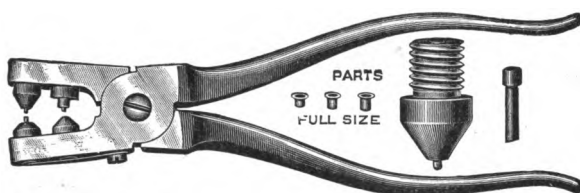
8403



8408

- 8403 Surveyors' Bag, Large**, fine quality and very durable; made of Solid Russet Leather, carefully sewed. 22 inches long; 9 inches wide; 9½ inches high. With shoulder strap....each, 7.50
- 8405 Surveyors' Bag, Medium**, same as No. 8403, but 19½ inches long; 8½ inches wide; 9 inches high..... " 6.50
- 8407 Surveyors' Bag, Small**, same as No. 8403, but 17½ inches long; 7½ inches wide; 8 inches high..... " 5.90
- 8408 Surveyors' Bag**, made of Heavy White Cotton Duck, with Grain Leather Base. Hand made frame and heavy strap handles. Designed for heavy service, 14 in. long..... " 4.35

Repair Outfits for Tapes



- 8460** Repair Outfit, for mending steel tapes, including 1,000 eyelets, each, \$4.00
8462 Extra eyelets for above, per 1,000..... 1.25

Directions: Punch a hole in the first piece of tape, leave same in position on the die; hold the second piece of tape over the first and after matching the divisions punch a hole in this second piece. Release the two pieces, insert an eyelet on the loose pin and clamp lightly, just enough to hold the two pieces together. Swing the two pieces apart and punch the second hole in the same manner, one piece at a time. Then insert second eyelet and clinch both eyelets. Although the punch will perforate two pieces of thin steel tape at once, it will be safer, and it will add to the life of the punch to proceed as described, by punching only one thickness of tape at one time. The holes can be cut near the edge of the tape, without any danger of splitting same, thus avoiding any chance of dirt collecting under the splice, or cutting the fingers when drawing the tape through the hands. Five minutes is the average time required to make a repair. They are in use in all of the principal engineering offices in the country.

Separate Parts for Repair Outfit No. 8460.

Punching Dies.....Outer Punch,	\$.65.....Inner Punch,	\$.75
Setting Dies.....Outer Die,	.50.....Inner Die,	.50
Rubbers to release tape from Punching Dies.....each,		\$.10
Yielding Point Springs.....each,	\$.10	New Handles..... " .90
Punching Pins (see illustration)		" .25

Little Giant Tape Splice



An exceedingly useful device for making temporary repairs of broken tapes, thereby saving delay in the work. When a tape breaks, the broken ends are inserted into the splice, adjusted by the sight hole, and by turning down screws with a knife blade, tape is ready for use. Will not catch on obstructions and holds against strongest pull.

- 8470** Little Giant Tape Splice, to fit $\frac{1}{4}$ in. or $\frac{3}{16}$ in. tapes 3 for \$1.00 each, \$.35
8472 Little Giant Tape Splice, to fit $\frac{3}{8}$ in. tapes..... 3 " 1.00 " .35

Eureka Tape Splice.

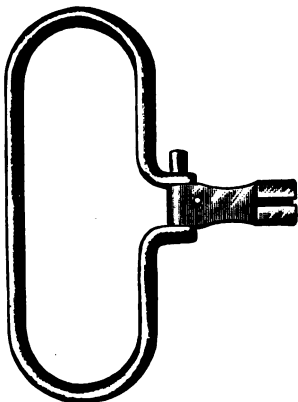
Consists of thin sheet metal folded in the shape of a sleeve and coated with a combination of solder and flux so sensitive that it will make a perfect adhesion with the tape, by simply heating with a lighted match.

A neat and durable repair can be made in the field in a minute or less. Put up in small round wooden boxes with screw cover. Made in all widths to match the standard steel tapes. Directions with each box.

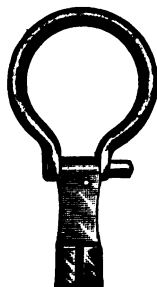
- 8474** Eureka Tape Splice...Per box of 1 doz., \$.50 per box of $\frac{1}{2}$ doz., \$.30
 In ordering please state width of tape for which splices are wanted.



Attachments for Steel Tapes

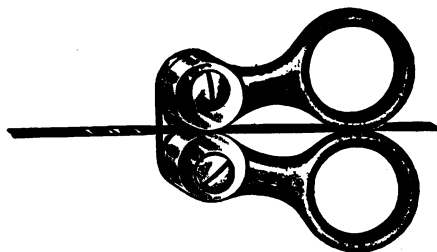


8476

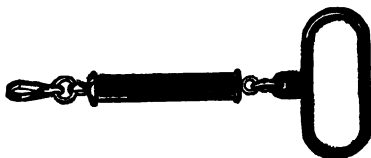


8478

- 8476 Tape Handles, Detachable, 3 in. oval.....per pair, \$1.00
 8478 Tape Handles, Detachable, 1 in., round..... " " .50



- 8480 Tape Clamp, Brass, Nickel Plated, for attaching to any part
 of a steel tape.....each, \$1.00



- 8482 Tension Handles, Brass, Nickel Plated. For applying the
 exact tension at which a steel tape is standard. Tension
 up to 20 lbs., indicated in half pounds.....each, \$2.50

Attachments for Steel Tapes—Continued

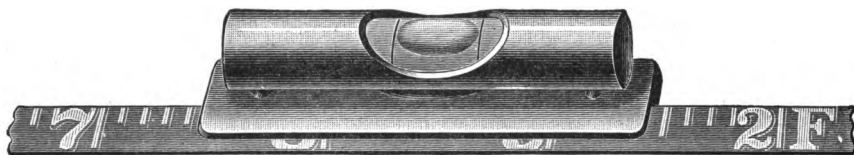
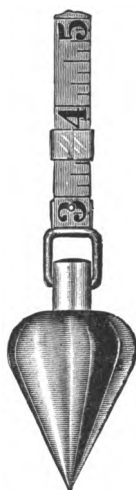


Illustration full size.

- 8484 Tape Level**, for assisting in holding the tape level. Particularly useful in taping up or down hill. Can be instantly attached or detached to any steel tape.....each, \$ 1.50



- 8486 Plumb Bob Attachment** for steel tapes. Used for measuring depth of liquids in tanks, such as water, oil, etc. The plumb bob is nickel plated and provided with a detachable clip for fastening the tape. When attaching to tape cut off the tape so as to include the length of the attachment in the measurement, each \$1.10

Tape Repairs

Steel and Metallic Tapes Repaired at Short Notice.

Repairing steel or metallic tapes, per break..... \$.35
Each additional foot of new tape..... .10

Tapes with U. S. Government Certificates

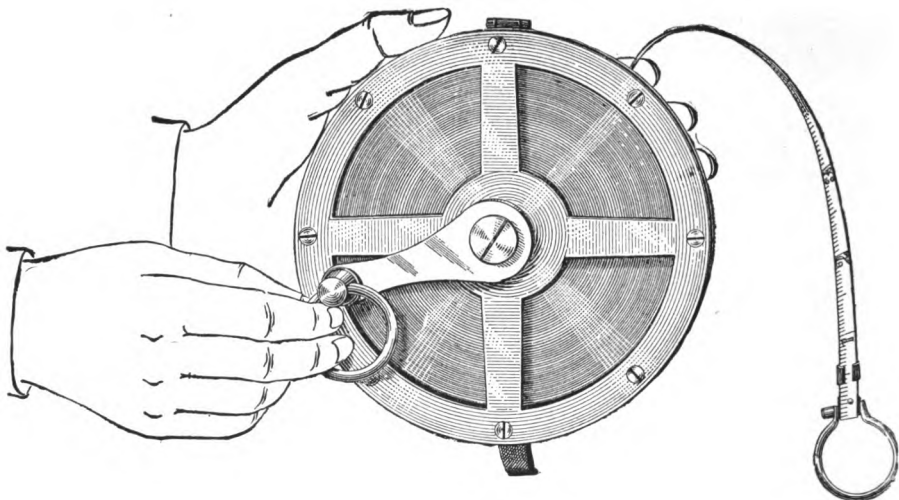
Can furnish any of the steel tapes listed in the following pages with a certificate of accuracy attested by the Bureau of Weights and Measurements at Washington, D. C., at an additional cost of..... \$1.25

For the convenience of our customers and to save the delay of sending tapes to Washington, we carry in stock 50 and 100 ft. tapes $\frac{1}{4}$ in. wide (of all the principal numbers listed in the following pages) with the U. S. Government certificate.



"Eckel Tape Reel"

The Most Practical and Most Serviceable Tape Reel Ever on the Market.



"Eckel Tape Reel," named after F. Eckel (our predecessor in the manufacture of Surveying Instruments), who originally designed and manufactured this reel. Made of hard aluminum alloy, with leather strap. Very strong and very durable.

With Steel Tape $\frac{1}{4}$ in. Wide.

Divisions begin at extreme end of tape.

- | | | | |
|------|---|---------|------------------|
| 8490 | "Eckel Reel" with Lufkin Steel Tape, 50 ft..each, | \$10.50 | 100 ft., \$14.50 |
| 8491 | "Eckel Reel" with Eddy Steel Tape, 50 ft. " | 11.50 | " 17.00 |

With Steel Tape $\frac{3}{16}$ in. Wide.

Divisions begin at extreme end of tape.

- | | | | |
|------|---|---------|------------------|
| 8492 | "Eckel Reel" with Lufkin Steel Tape, 50 ft..each, | \$10.50 | 100 ft., \$14.50 |
|------|---|---------|------------------|

"Eckel Reel" Only, Without Tape.

- | | | |
|------|--|--------|
| 8494 | "Eckel Reel" to fit 50 ft. steel tape of any standard width..each, | \$6.50 |
| 8495 | "Eckel Reel" to fit 100 ft. steel tape of any standard width.. " | 7.00 |

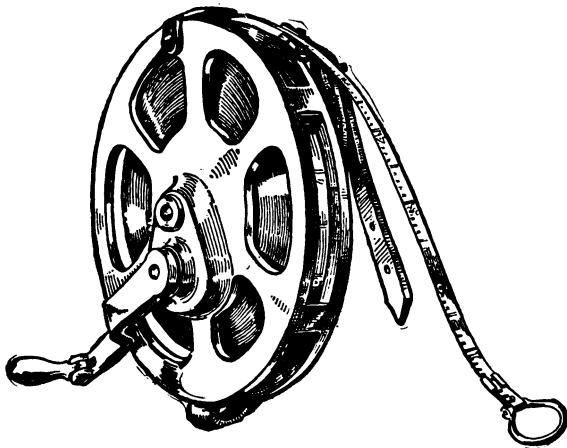
In ordering tapes with reel, please state whether 10ths or 12ths are desired.

In ordering reels Nos. 8496 and 8498, please state width of tape for which reel is desired.

"Lewis Ideal" Tape Reel

Patented April 8th, 1913

The Only Geared Tape Reel on the Market



The "Lewis Ideal" Tape Reel represents the highest development in tape reel design and construction. A perfect tape-winding machine that will save its cost in a few days' use and make chaining a pleasure instead of a drudgery. Now being used by leading municipal and railroad engineers throughout the country.

Made of hard aluminum alloy. Wearing parts of hard steel, handle of bronze. $5\frac{1}{2}$ in. diameter, weight 10 ounces. With high-speed gearing, which will wind up 100 feet of steel tape in about 12 seconds (one-third of the usual time). Particularly desirable in city streets, where it is necessary to be able to wind a tape quickly in order to save same from being broken by passing vehicles.

Brake for stopping motion of tape at any point and holding it rigid without perceptible effort on the part of the operator. Valuable in winter, as it obviates the necessity of removing gloves.

Long Flush Folding Handle for making winding easy. Dustproof Gear Case and Automatic Cleaning Device. Frictionless large-diameter drum and improved arrangement for attaching tape. Provided with adjustable leather handle.

Complete with $\frac{1}{4}$ inch Steel Tape, 10ths or 12ths.

- 8497 "Lewis Ideal" Tape Reel with 100 ft. Eddy Steel Tape...each, \$17.50
 8498 "Lewis Ideal" Tape Reel with 100 ft. Lufkin Steel Tape.. " 15.00

In ordering please mention whether 10th or 12ths are desired.

Reel Only, Without Tape

- 8499 "Lewis Ideal" Tape Reel, to hold 100 ft. Steel Tape, $\frac{1}{4}$ in. wideeach, \$7.50

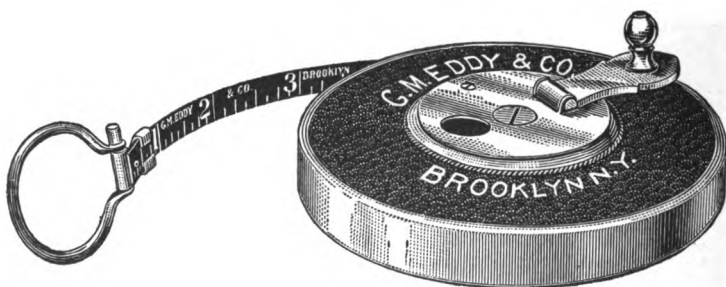


Eddy Steel Measuring Tapes, Paine's Patent



- 8501 Paine's Patent Steel Tapes, $\frac{1}{4}$ inch heavy steel.** Steel lined cases covered with russet leather. All trimmings nickel plated. Two finger rings with each tape. **U. S. Standard**, graduations begin at extreme end of tape. 10ths or 12ths:

	33	50	66	75	100 feet long
Each.....	\$5.50	8.00	10.00	12.00	15.00
English and meters, each..	6.50	9.50	12.00	14.25	18.00



- 8503 Paine's Patent Steel Tapes, $\frac{1}{4}$ inch heavy steel.** Contained in steel cases covered with morocco and brass bound. Brass flush handles. Two finger rings with each tape. **U. S. Standard**, graduations begin at extreme end of tape. 10ths or 12ths:

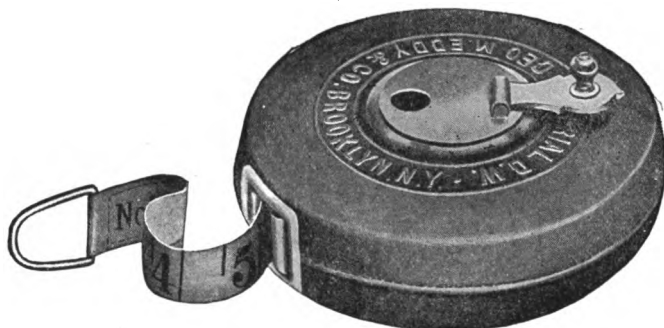
	33	50	66	75	100 feet long
Each.....	\$4.50	6.00	8.00	10.00	12.00
English and meters, each..	5.50	7.50	10.00	12.25	15.00

Refills for Nos. 8501 and 8503.

	33	50	66	75	100 feet long
Each	\$3.30	5.00	6.60	7.50	10.00

In ordering, please state whether 10ths, 12ths or metric are desired.

Eddy Metallic Measuring Tapes



EDDY METALLIC TAPES, $\frac{5}{8}$ in. wide. Made of the best woven linen and contain metal threads to prevent stretching; are nicely finished, re-enforced on the first end with leather to prevent breaking and are as nearly waterproof as possible. Cases of heavy russet leather, fitted with flush handles and all metal parts nickel plated. Measurements begin at end of ring.

8505 Eddy Metallic Tapes, marked on one side only, 10ths or 12ths.

	25	50	66	75	100 ft. long
Each.....	\$1.75	2.50	3.00	3.50	4.00

8507 Eddy Metallic Tapes, marked on both sides. 10ths or 12ths on one side and metric on the other.

	33	50	66	100 ft. long
	(10 meters)	(15 meters)	(20 meters)	(30 meters)
Each.....	\$2.10	2.60	3.10	4.20

Tapes Without Cases

8508 Eddy Metallic Tapes, without cases, marked one side, 10ths or 12ths.

	25	50	66	75	100 ft. long
Each	\$.90	1.25	1.50	1.75	2.00

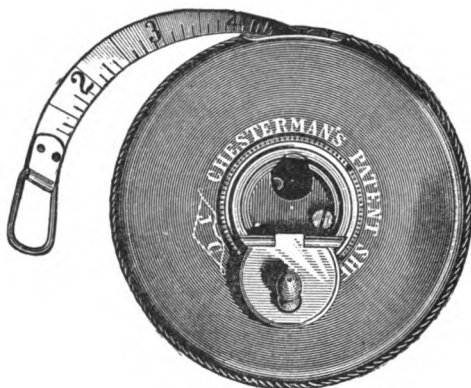
8509 Eddy Metallic Tapes, without cases, marked on both sides. 10ths or 12ths on one side and metric on the other.

	33	50	66	100 ft. long
	(10 meters)	(15 meters)	(20 meters)	(30 meters)
Each ...	\$1.05	1.30	1.55	2.10

In ordering please state whether 10ths, 12ths or metric are desired.



Chesterman's Steel Measuring Tapes



- 8512. Chesterman's Steel Measuring Tapes, $\frac{3}{8}$ inch steel.** Red leather case with flush handles. Graduations begin at outer end of ring.
10ths or 12ths on one side, links on reverse side.

	25	50	75	100 feet long
Each	\$4.50	7.20	10.40	12.80

Chesterman's Metallic Measuring Tapes



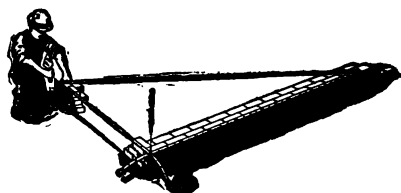
Chesterman's Metallic Tapes, $\frac{5}{8}$ in. wide, of best woven linen, with metallic warp, folding handle, in leather case. Graduations begin at outer end of ring.

10ths or 12ths on one side, links on reverse side.

	25	50	75	100 feet long
8514 Tape in case, each	\$1.80	2.60	3.30	4.20
8515 Tape without case, each.....	.90	1.50	2.00	2.90

In ordering please state whether 10ths or 12ths are desired.

Roe's Angle Tape and Roe's Steel Tape Chains



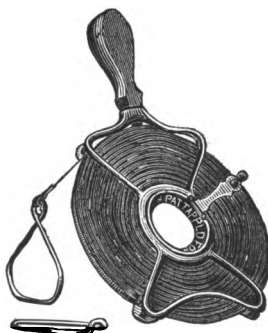
Mason Squaring Foundation with "Roe's Patent Angle Tape."

8522 Roe's Patent Angle Steel Measuring Tapes, $\frac{3}{8}$ inch steel. Hard leather case with nickel plated trimmings. 10ths or 12ths:

	25	50	75	100 feet long
Each	\$3.25	4.00	5.25	6.75

In ordering, please state whether 10ths or 12ths are desired.

This tape can be used for all kinds of measurements and also for laying out right angles much quicker than by any other method and equally accurate. Its principle is the old trigonometrical formula that 6, 8 and 10 ft. sides of a triangle secure a right angle. This form is embodied in the tape, by providing it at the 1, 9, 19 and 25 ft. marks with eyelets, the 9 and 19 ft. marks also with joints. To use the tape, fasten it at the starting point with a small marking pin or nail through the eyelet at figure 1 on tape; then fasten it at figure 9 as shown in illustration; place the 25 ft. mark over the starting point and taking hold of the tape at the 19 ft. mark pull it straight as shown in cut. You will then have a perfect right angle at the starting point. The advantages of this tape are obvious. A perfect right angle is obtained in a few minutes.



8524 Roe's Steel Tape Chains, 3-16 in. wide, on metal reel:

	50	100	200	300	500 feet
Plain	\$4.00	5.00	7.50	8.00	12.00
Nickel Plated	5.00	6.00	9.00	10.00	15.00
Aluminum Plated	5.50	7.00	10.50	12.00	18.00

Tapes 50, 100, 200 feet long, graduated every foot. End foot in tenths.
Tapes 300, 500 feet long, graduated every five feet. End foot in tenths.
Reels only, for 50 and 100 foot tapes.....each, \$1.50

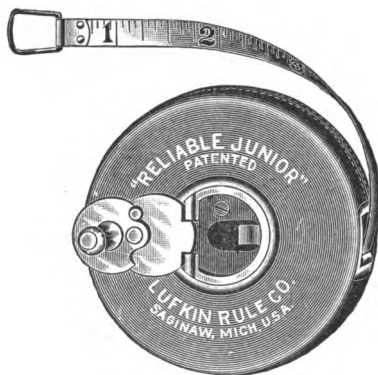


Lufkin Steel Measuring Tapes with Instantaneous Readings



The "INSTANTANEOUS READING" as furnished on all Lufkin Steel Tapes listed in the following pages makes errors impossible and saves time. Consists of repeating the foot mark, in easily distinguishable figures, at each inch or 10th of a foot. Does away with all referring back to the last foot and the consequent errors and delays. The entire reading is always directly before the eye.

"Reliable Junior" Steel Tapes with Instantaneous Readings



"Reliable Junior" Steel Tapes, $\frac{1}{4}$ in. wide, with double folding flush handle opened by pressing small pin or button on opposite side. Hard leather cases. Nickel plated trimmings. **U. S. Standard.** Graduations begin at outer end of ring.

	25	33	50	66	75	100 ft. long
Diameter of case	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{3}{4}$ inches
8526 Tape in case, each.....	\$3.75	4.00	4.60	5.25	5.75	7.00
8528 Tape without case, each.....	2.25	2.50	2.75	3.25	3.50	4.50

In ordering please state whether 10ths or 12ths are desired.

Lufkin Steel Measuring Tapes—Continued With Instantaneous Readings



"Reliable" Steel Measuring Tapes, with double folding flush handle, opened by pressing small pin or button on opposite side. Hard leather cases. Nickel plated trimmings. **U. S. Standard.** Graduations begin at outer end of ring. Marked one side only, 10ths and 12ths.

"Reliable" Steel Measuring Tapes, $\frac{3}{8}$ inch wide.

		33	50	66	75	100	150	200 ft.
8529	Tape in case, each.....	\$5.20	7.20	9.20	10.40	12.80	18.50	24.00
8531	Tape without case, each..	3.60	5.40	7.20	8.00	10.20	15.30	20.00

"Reliable" Steel Measuring Tapes, $\frac{1}{2}$ inch wide.

		33	50	66	75	100	150	200 ft.
8532	Tape in case, each.....	\$5.85	8.10	10.35	11.70	14.40	21.00	27.00
8533	Tape without case, each..	4.10	6.10	8.10	9.00	11.50	17.20	23.60

"Reliable" Steel Measuring Tapes, $\frac{5}{8}$ inch wide.

		33	50	66	75	100 ft.
8536	Tape in case, each.....	\$6.60	9.10	11.65	13.20	16.20
8537	Tape without case, each.....	4.60	6.90	9.10	10.10	12.90

"Reliable" Steel Measuring Tapes, $\frac{3}{4}$ inch wide.

		33	50	66	75	100 ft.
8538	Tape in case, each.....	\$7.40	10.20	13.10	14.85	18.20
8539	Tape without case, each.....	5.20	7.80	10.20	11.40	14.50

In ordering please state whether 10ths or 12ths are desired.

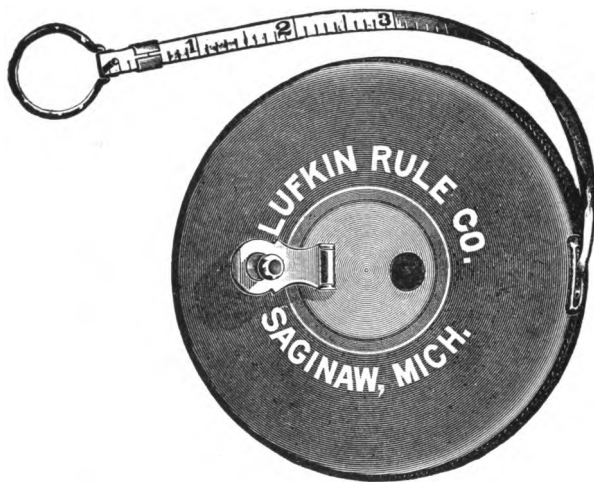
Tapes marked metric measure on one side only same price as corresponding length in feet.

Tapes marked feet on one side, metric measure on the other, add 1 cent per foot to list price.



Lufkin Steel Measuring Tapes—Continued With Instantaneous Readings

In Leather Cases.



"Engineers Pattern" Steel Tapes, $\frac{1}{4}$ in. wide. Heavy steel. Hard leather steel lined cases, nickel plated trimmings, two detachable handles. The tape can be instantly detached from the case. **U. S. Standard.** Graduations begin at extreme end of tape. Marked one side only, 10ths or 12ths.

		33	50	66	75	100 ft. long
8541	Tape in case, each	\$5.00	6.00	8.00	9.50	12.00
8542	Tape without case, each.....	3.25	4.00	5.00	6.00	7.50

In ordering please state whether 10ths or 12ths are desired.

Metric, marked one side only in meters and centimeters. The first 10 centimeters in millimeters.

		10	15	20	25	30 meters long
8543	Tape in case, each	\$5.00	6.00	8.00	10.25	12.00
8544	Tape without case, each.....	3.25	4.00	5.00	7.25	7.50

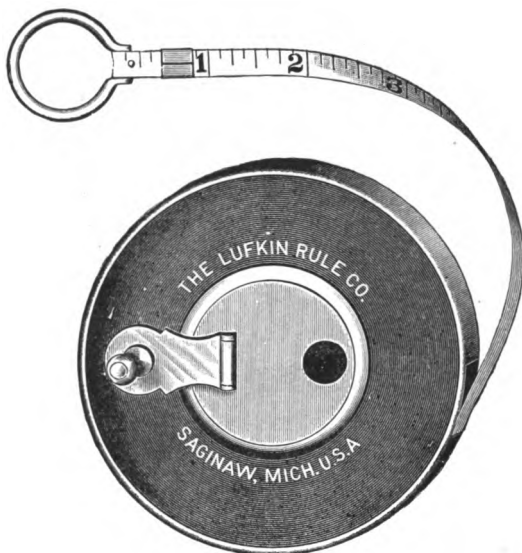
"Engineers Pattern" Steel Tapes, $\frac{3}{16}$ inch wide.

		33	50	66	75	100 ft. long
8552	Tape in case, each.....	\$5.00	6.00	8.00	9.50	12.00
8553	Tape without case, each.....	3.25	4.00	5.00	6.00	7.50

Marked one side only, 10ths or 12ths. In ordering please state which are desired.

Tapes Nos. 8541-8544 furnished if desired with first foot re-enforced. 100 ft. tape carried in stock; other sizes to order. Add 45 cents to list of tape for this addition.

Lufkin Steel Measuring Tapes—Continued
With Instantaneous Readings
In Steel Cases.



“Engineers Pattern” Steel Tapes, $\frac{1}{4}$ inch wide. Heavy steel. Black enameled steel cases bound with nickel plated brass. Two detachable handles. The tape can be instantly detached from the case. **U. S. Standard.** Graduations begin at extreme end of tape. Marked one side only 10ths or 12ths.

		33	50	66	75	100 ft. long
8557	Tape in case, each	\$4.25	5.25	7.00	8.75	10.50
8558	Tape without case, each.....	3.25	4.00	5.00	6.00	7.50

In ordering please state whether 10ths or 12ths are desired.

Metric, marked one side only in meters and centimeters. The first 10 centimeters in millimeters.

		10	15	20	25	30 meters long
8559	Tape in case, each	\$4.25	5.25	7.00	9.50	10.50
8561	Tape without case, each.....	3.25	4.00	5.00	6.50	7.50

“Engineers Pattern” Steel Tapes, $\frac{3}{16}$ inch wide.

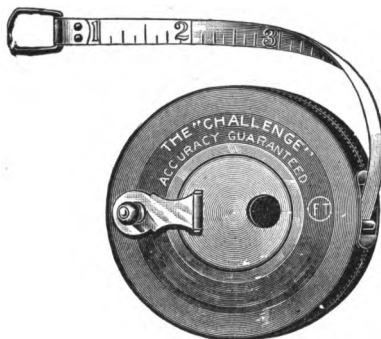
		33	50	66	75	100 ft. long
8563	Tape in case, each.....	\$4.25	5.25	7.00	8.75	10.50
8564	Tape without case, each.....	3.25	4.00	5.00	6.00	7.50

In ordering please state whether 10ths or 12ths are desired.



Lufkin Steel Measuring Tapes—Continued

With Instantaneous Readings



"Challenge" Steel Tapes. Hard leather cases, nickel plated trimmings, flush handles. U. S. Standard. Graduations begin at outer end of ring.

"Challenge" Steel Tapes, $\frac{1}{2}$ inch wide, marked one side only, 10ths or 12ths.

		25	33	50	66	75	100 ft. long
	Diameter of case	$2\frac{3}{4}$	$2\frac{3}{4}$	$3\frac{1}{4}$	$3\frac{3}{4}$	$4\frac{1}{4}$	$4\frac{1}{2}$ inches
8565	Tape in case, each	\$3.75	4.00	4.50	5.50	6.00	7.50

"Challenge" Steel Tapes, $\frac{1}{2}$ inch wide. Metric one side only in meters and centimeters. The first 10 centimeters in millimeters.

		10	15	20	25	30 meters long
8567	Tape in case, each	\$4.00	4.50	5.50	6.75	7.50

"Challenge" Steel Tapes, $\frac{3}{8}$ inch wide. Marked one side only, 10ths or 12ths.

		25	33	50	66	75	100 ft. long
	Diameter of case	$2\frac{3}{4}$	$2\frac{3}{4}$	$3\frac{1}{4}$	$3\frac{3}{4}$	$4\frac{1}{4}$	$4\frac{1}{2}$ inches
8570	Tape in case, each	\$3.25	3.50	4.00	5.00	5.25	6.75
8571	Tape without case, each	2.40	2.60	3.00	3.75	4.00	5.25

"Challenge" Steel Tapes, $\frac{3}{8}$ inch wide. Metric one side only, meters and centimeters. The first 10 centimeters in millimeters.

		10	15	20	25	30 meters long
8573	Tape in case, each	\$3.50	4.00	5.00	6.00	6.75

"CHALLENGE JUNIOR" STEEL MEASURING TAPES

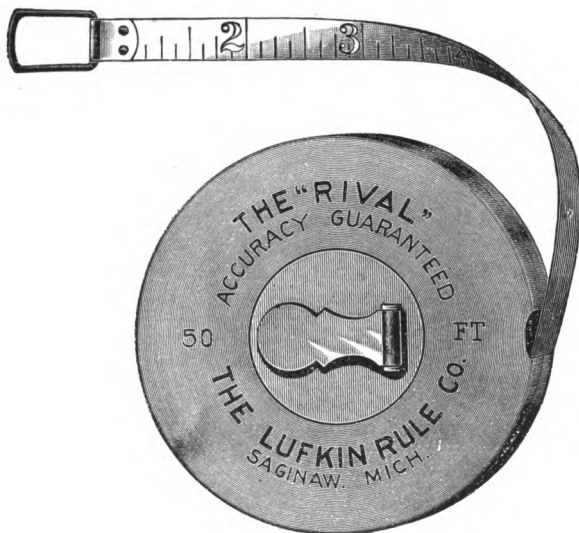
"Challenge Junior" Steel Measuring Tapes, $\frac{1}{4}$ inch wide. Hard leather cases, nickel plated trimmings. U. S. Standard. Graduations begin at outer end of ring. Marked one side only, 10ths or 12ths. A very convenient vest pocket tape. 25 ft. tape weighs 3 ounces, 50 feet 5 ounces; other sizes in proportion.

		25	33	50	66	75	100 ft. long
	Diameter of case	$2\frac{1}{4}$	$2\frac{1}{2}$	$2\frac{3}{4}$	3	$3\frac{1}{2}$	$3\frac{3}{4}$ inches
8575	Tape in case, each	\$3.00	3.25	3.50	4.00	4.50	5.75
8576	Tape without case, each	2.25	2.50	2.75	3.25	3.50	4.50

In ordering please state whether 10ths or 12ths are desired.

Lufkin Steel Measuring Tapes—Continued

With Instantaneous Readings



"Rival" Steel Tapes, $\frac{3}{8}$ inch wide. Nickel plated steel cases, flush handles. U. S. Standard. Graduations begin at outer end of ring. Marked one side only, 10ths or 12ths.

	25	33	50	66	75	100 ft. long
Diameter of case	$2\frac{3}{4}$	$2\frac{3}{4}$	$3\frac{1}{4}$	$3\frac{3}{4}$	$3\frac{3}{4}$	$4\frac{1}{4}$ inches
8581 Tape in case, each	\$2.75	3.00	3.40	4.25	4.50	5.75
8582 Tape without case, each	2.40	2.60	3.00	3.75	4.00	5.25
8583 "Rival" Steel Tape, $\frac{3}{8}$ inch wide. Marked metric one side only, meters and centimeters; the first 10 centimeters in millimeters.						
	10	15	20	25	30 meters long	
Tape in case, each	\$3.00	3.40	4.25	5.10	5.75	

"Rival Junior" Steel Measuring Tapes

"Rival Junior" Steel Tapes, $\frac{1}{4}$ inch wide. Nickel plated steel cases, flush handles. U. S. Standard. Graduations begin at outer end of ring. Marked one side only, 10ths or 12ths.

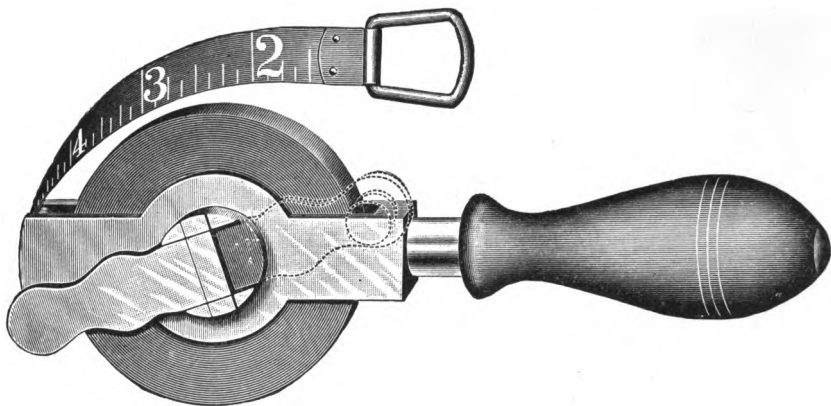
	25	33	50	66	75	100 ft. long
Diameter of case	$2\frac{1}{4}$	$2\frac{1}{4}$	$2\frac{3}{4}$	3	$3\frac{1}{4}$	$3\frac{3}{8}$ inches
8586 Tape in case, each	\$2.50	2.75	3.00	3.50	4.00	5.00
8587 Tape without case, each	2.25	2.50	2.75	3.25	3.50	4.50

In ordering, please state whether 10ths or 12ths are desired.



Lufkin Steel Measuring Tapes—Continued

With Instantaneous Readings



"Lock Handle Frame," made of brass, nickel plated, with a folding lock handle which folds over the tape, enabling one to stop at any desired length. The extra length of the handle affords increased winding facilities. **U. S. Standard.** Marked one side only, 10ths or 12ths.

- 8601 "Lock Handle Frame,"** with $\frac{1}{4}$ inch steel tape, detachable handle. Graduations begin at extreme end of tape.

	33	50	66	75	100 ft. long
Complete, each	\$4.25	5.25	6.25	7.50	9.00

- 8603 "Lock Handle Frame,"** with $\frac{3}{8}$ inch steel tape, ring handle. **U. S. Standard.** Graduations begin at outer end of ring. Marked one side only, 10ths or 12ths.

	33	50	66	75	100 ft. long
Complete, each	\$3.50	4.50	5.25	6.25	7.75

- 8606 "Lock Handle Frame,"** with $\frac{1}{2}$ inch steel tape, ring handle. **U. S. Standard.** Graduations begin at outer end of ring. Marked one side only, 10ths and 12ths.

	33	50	66	75	100 ft. long
Complete, each	\$4.25	5.25	6.25	7.50	9.00

- 8608 "Lock Handle Frame,"** with **Phosphor Bronze Tape**, nickel plated, $\frac{1}{2}$ inch wide. Adapted for use in places where a steel tape is affected by gases, salt water acids, etc. **U. S. Standard.** Graduations begin at outer end of ring. Marked one side only, 10ths or 12ths.

50 feet, each..... \$8.00 100 feet, each.....\$13.50

In ordering please state whether 10ths or 12ths are required.

100 ft. tapes of above numbers supplied with a four arm piece.

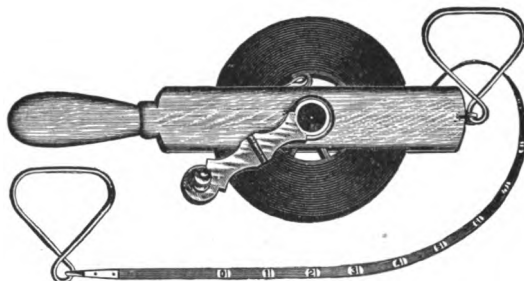
Tapes marked metric measure on one side only at same price as corresponding length in feet.

Tapes marked feet in 10ths or 12ths on one side and metric measure on the other side, add 2 cents per foot to list price.

Lufkin Surveyors' Tape Chains



Method of Graduating



Surveyors' Tape Chains, $\frac{1}{4}$ inch wide, Heavy Steel, graduated every foot and end feet in one-tenths. Where the tape is graduated, the steel has a bright raised surface with the figures etched in. As the steel is of the finest quality and well tempered, the graduations and figures will not wear off, but will always be clear and distinct. Furnished in hardwood reel with large metal folding handle and two large detachable rings. Trim-mings nicely nickel plated. The frame and winding apparatus is strong, durable and compact. Tape is detachable. When tape is not in use the handles are fastened to the frame, where they will not get lost, and at the same time serve as a convenient handle for carrying the complete tape.

		100	150	200	300 ft. long
8620	Tapes complete with reel	each, \$6.00	7.50	9.00	12.50
8621	Tape only, with rings.....	" 4.00	5.50	7.00	10.50

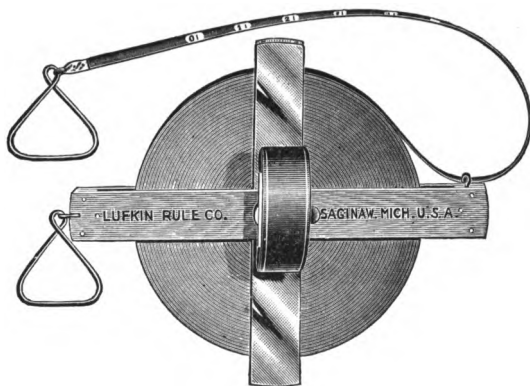
Surveyors' Tape Chains, Metric Graduations One Side Only.

The first decimeter in millimeters, balance of first meter in centimeters, balance of tape in decimeters.

		25	30	50	100 meters
8622	Tapes complete with reel, each,	\$5.75	6.50	9.50	17.00
8623	Tape only, with rings.....	" 3.75	4.50	7.50	15.00
8624	Reel only, without tape or rings.....				each, \$2.00
8628	Ring Handles for above tapes.....				per pair, \$.50



Lufkin Surveyors' Tape Chains—Continued



Folding Reel.



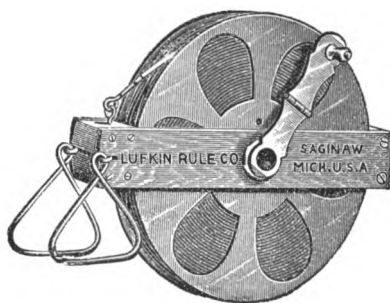
Reel Folded.

Surveyors' Tape Chains, as described on page 303. The reel has steel cross-arms, which keep the tape in place when winding or unwinding. When tape is in use and removed from the reel, the metal cross-arms of the reel fold into the wooden frame, so that even the large sizes can be conveniently carried in the pocket. The reel can be held firmly by running the hand through the strong leather loop fastened to the side of same. These reels are especially desirable for the larger tapes.

		100	150	200	300	500	650 ft.
8630	Tapes complete with reel, each.	\$7.50	9.00	10.50	14.00	21.50	28.00
8631	Tapes only, with rings, each....	4.00	5.50	7.00	10.50	18.00	24.50
		25	30	50	100 meters		
8635	Tapes complete with reel, each.....	\$7.25	8.00	11.00	18.50		
8636	Tapes only, with rings, each	3.75	4.50	7.50	15.00		
8638	Reel only, without tape or rings, each.....					\$3.50	
8639	Ring Handles for above tapes, per pair.....					.50	

Lufkin Surveyors' Tape Chains

With Heavy $\frac{1}{8}$ Inch Steel Tape



Surveyors' Tape Chains, with heavy $\frac{1}{8}$ inch steel tape, hardwood frame with substantial sheet steel open reel. Large metal folding winding handle and two large detachable rings, which can, for convenience of carrying, be fastened to the frame when the tape is not in use. One side of the frame is provided with a large and convenient leather loop for holding. Tapes graduated same as described on pages 303 and 304.

		100	150	200	300	500	650 ft.
8645	Tapes complete with reel, each.	\$7.50	9.00	10.50	14.00	21.50	28.00
8646	Tapes only, with rings, each...	4.00	5.50	7.00	10.50	18.00	24.50

		25	30	50	100 meters
8647	Tapes complete with reel, each.....	\$7.25	8.00	11.00	18.50
8648	Tapes only, with rings, each.....	3.75	4.50	7.50	15.00
8649	Reels only, without tapes or rings, each	\$3.50			
8651	Ring Handles for above tapes, per pair.....	.50			



Lufkin Surveyors' Tape Chains

Graduated on Babbit Metal



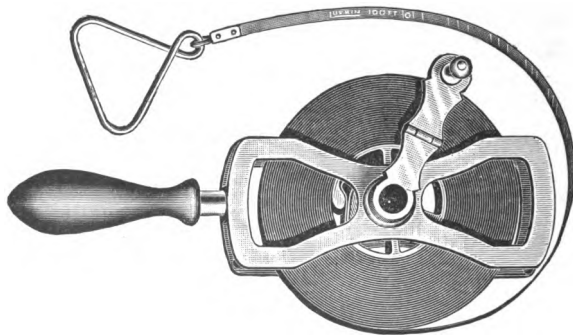
This Tape is to supply the demand for tape chains with graduations stamped on soft metal. Slightly heavier than the regular tape chains and guaranteed to be the best tape of this kind on the market. Graduations are stamped into the **Babbit Metal** at each foot, end feet in 10ths. Each tape provided with a pair of detachable rings or rawhide thongs as desired.

8653 Babbit Metal Tape Chain, **5/16 inch wide**, tape only with rings.

		100	200	300	500 ft.long
Each	.....	\$4.00	6.35	8.40	13.65

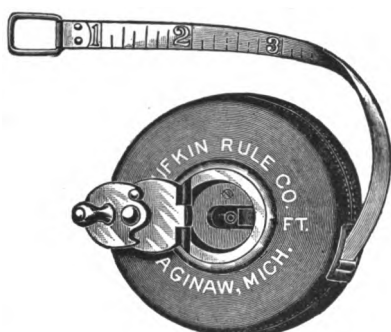
8656 Babbit Metal Tape Chain, **3/16 inch wide**, tape only with rings.

		100	200	300	500 ft.long
Each	.....	\$4.00	6.35	8.40	13.65



8658 Reel for above tapes, brass, nickel plated, with folding handle and rosewood grip, very strong and serviceable. For **100 feet tapes only**. Larger lengths are usually desired without reel, each\$2.50

Lufkin Metallic Measuring Tapes



8661-8671



8673-8679

Lufkin Metallic Measuring Tapes, $\frac{5}{8}$ inch wide. Made of best woven linen and contain metal threads to prevent stretching. Are nicely finished and re-enforced on the first end with leather to prevent breaking. Are as nearly waterproof as possible. Cases of hard leather with double folding flush handle opened by pressing small pin or button on opposite side. All trimmings nickel plated. Graduations begin at outer end of ring.

		Marked one side only, 12ths.					
		25	33	50	66	75	100 ft. long
8661	Tapes in case, each	\$2.00	2.30	2.80	3.10	3.40	4.20
8662	Tapes without case, each .....	.80	1.00	1.40	1.60	1.80	2.60
		25	33	50	66	75	100 ft. long
8666	Tapes in cases, each	\$2.10	2.40	2.90	3.30	3.60	4.50
8667	Tapes without cases, each ....	.90	1.10	1.50	1.80	2.00	2.90

		Marked one side only, meters and centimeters.					
		10	15	20	25	30	meters long
8669	Tapes in cases, each	\$2.30	2.80	3.10	3.70	4.20	
8671	Tapes without cases, each	1.00	1.40	1.60	2.10	2.60	

Lufkin Metallic Measuring Tapes, $\frac{5}{8}$ inch wide, same as described above, but with brass folding handles and brass trimmings.

		Marked one side only, 12ths.					
		25	33	50	66	75	100 ft. long
8673	Tapes in cases, each	\$1.70	2.00	2.50	2.80	3.10	3.90
8674	Tapes without cases, each ....	.80	1.00	1.40	1.60	1.80	2.60
		25	33	50	66	75	100 ft. long
8676	Tapes in cases, each	\$1.80	2.10	2.60	3.00	3.30	4.20
8677	Tapes without cases, each ....	.90	1.10	1.50	1.80	2.00	2.90

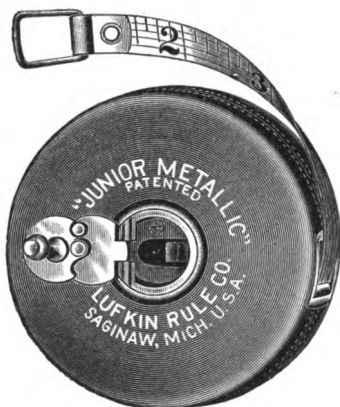
		Marked on one side only, meters and centimeters.					
		10	15	20	25	30	meters long
8678	Tapes in cases, each	\$2.00	2.50	2.80	3.40	3.90	
8679	Tapes without cases, each	1.00	1.40	1.60	2.10	2.60	

In ordering please state whether 10ths or 12ths are desired.

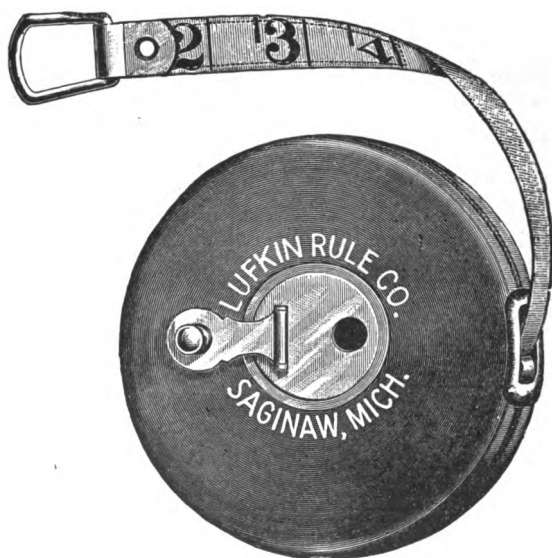


Lufkin Metallic Measuring Tapes—Continued

"Junior Metallic" Measuring Tapes, $\frac{3}{8}$ inch wide, with patent double folding handle opened by pressing pin or button on opposite side. Tape is made of best woven linen with metallic warp. Hard leather cases, nickel plated trimmings. Marked on one side only, 10ths or 12ths. Graduations begin at outer end of ring.



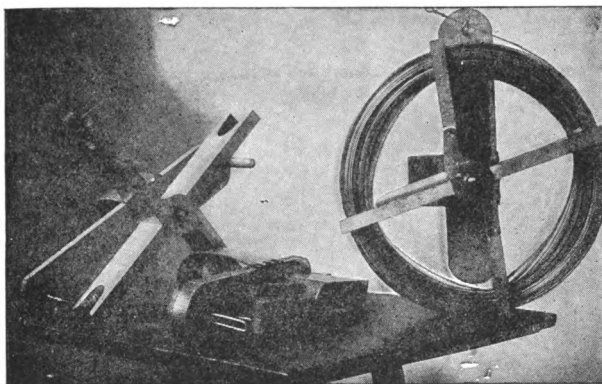
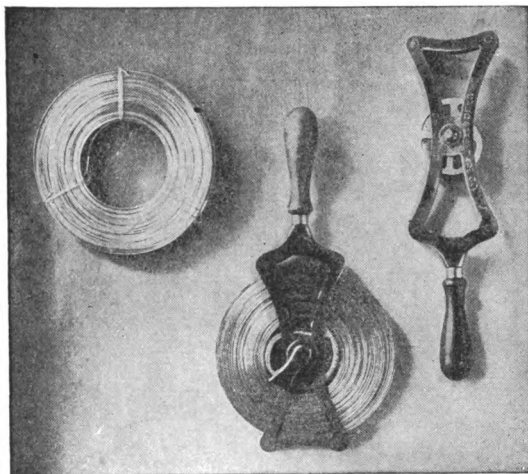
	25	33	50	66 feet
Diameter of case—	2 $\frac{3}{4}$	3	3 $\frac{1}{2}$	3 $\frac{3}{4}$ inches
8685 Tape in case, each	\$1.80	2.00	2.25	2.75
8686 Tape without case, each .....	.75	.90	1.25	1.50



"Sterling" Linen Measuring Tapes, $\frac{5}{8}$ inch wide, made of pure linen, heavily coated and reinforced with leather at beginning of tape. Hard leather cases, nickel plated trimmings. Marked one side only, 10ths or 12ths. Graduations begin at outer end of ring.

	25	50	75	100 feet
8690 Tape in case, each.....	\$1.25	1.65	2.10	2.50
8691 Tape without case, each.....	.70	1.00	1.25	1.50

In ordering please state whether 10ths or 12ths are desired.



Chicago Steel Tapes, 5/16 inch wide and 1/64 inch thick. Plainly marked and numbered at every foot, with the end divisions in 10ths. Graduations are marked on the hardest solder obtainable, by templates standardized to U. S. standard and guaranteed to be absolutely correct. Not so highly tempered as the regular steel tapes and therefore not easily broken. Furnished in metallic or in wooden reels. The latter can be folded up so that they can be conveniently carried in the pocket. Raw hide or metallic handles supplied with each tape. Graduations begin at end of tape. Furnished to order at short notice, with divisions beginning 6 inches from the end.

		50	100	200	300	500 feet
8740	In Metallic Reel.....each,	\$4.25	5.00	9.00	12.00	18.00
8742	In Wooden Reel	3.75	4.50	6.75	9.50	14.50
8744	Tape only, without reel. "	3.00	3.75	6.00	8.00	13.00
		20	40 meter	100	200 links	
8750	In Metallic Reel	each, \$4.25	7.00	4.25	7.00	
8752	In Wooden Reel	" 3.75	5.75	3.75	5.75	
8754	Tape only, without reel....	" 3.00	5.00	3.00	5.00	



Spring Balance Tapes

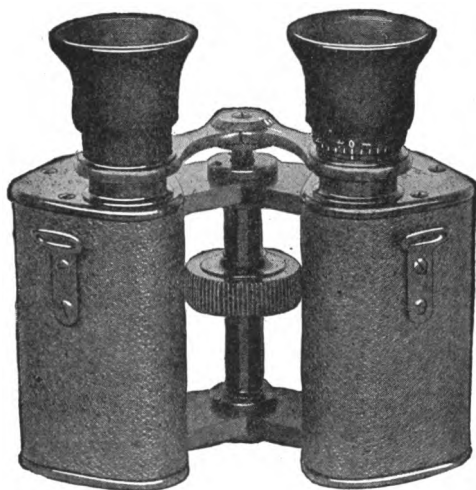


- 8760** Spring Balance Tape, 3/32 inch steel, 50 feet long, adjustable for temperature, with spring balance, thermometer and spirit level attachment.....each, \$18.00



- 8765** Measuring Chains, Steel, best grade, brazed links and rings. Brass handles.
- | | 33 | 50 | 66 | 100 ft. | 10 | 15 | 20 | 25 meters |
|-----------|--------|------|-------|---------|------|------|-------|-----------|
| Each..... | \$5.50 | 6.00 | 10.00 | 11.00 | 5.50 | 7.50 | 10.00 | 12.50 |
- 8766** Measuring Chains, Steel, II quality, oval rings. Brass handles.
- | | 33 | 50 | 66 | 100 ft. | 10 | 15 | 20 meters |
|-----------|--------|------|------|---------|------|------|-----------|
| Each..... | \$3.50 | 4.50 | 6.50 | 8.00 | 3.50 | 5.00 | 6.20 |
- 8767** Measuring Chains, Iron, oval rings. Brass handles.
- | | 33 | 50 | 66 | 100 feet |
|-----------|--------|------|------|----------|
| Each..... | \$2.70 | 3.50 | 4.25 | 5.50 |
- 8768** Measuring Chains, Iron, round rings. Brass handles.
- | | 33 | 50 | 66 | 100 feet |
|------------|--------|------|------|----------|
| Each | \$2.00 | 2.50 | 3.20 | 3.50 |

Bush Prism Binoculars, for Field and Marine Use



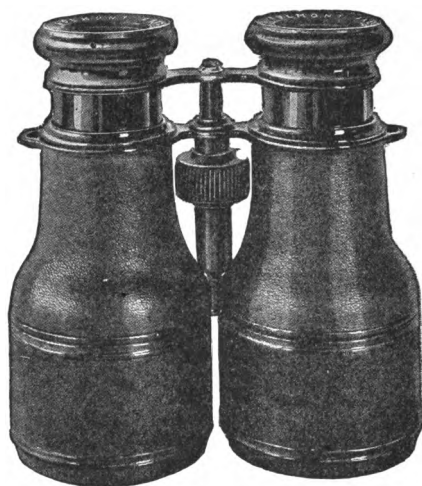
Prism Binoculars, for field and marine use. Adjustable for pupillary difference as well as for eye distance and focal distance. Body and cross-bars of one piece and the tubes are stationary, the hoods containing the eye-pieces sliding up and down. These features insure absolute and permanent alignment of the optical axis. Each binocular supplied with a sole leather, velvet-lined, hand-sewed carrying case with shoulder strap and adjustable strap attached to the glass.

		— Prices —						
		Power	Dia. of Object Glass	Field of View at 1,000 Yds	Height	Weight	Black Leather Body & Case	Tan Body & Case
8900	Stereo-Lynkop ..	6	¾ in.	125 yds.	3⅝ in.	14 oz.	\$40.00	\$42.00
8902	Stereo-Lynkop ..	8	¾ in.	100 yds.	3⅝ in.	14 oz.	40.00	42.00
8904	Stereo-Lynkop ..	12	¾ in.	75 yds.	3⅝ in.	14 oz.	40.00	
8920	Stereo-Ultralux .	6	1 in.	130 yds.	4 in.	16 oz.	50.00	52.00
8922	Stereo-Ultralux .	8	1 in.	115 yds.	4 in.	16 oz.	50.00	52.00
8930	Stellux	6	¾ in.	120 yds.	3 in.	9 oz.	50.00	
8932	Stellux	8	¾ in.	100 yds.	3 in.	9 oz.	50.00	
8940	Colmont-Stereo .	8	1 in.	100 yds.	4½ in.	19 oz.	30.00	
8945	Megaphos	8	¾ in.	95 yds.	4¼ in.	17 oz.	25.00	



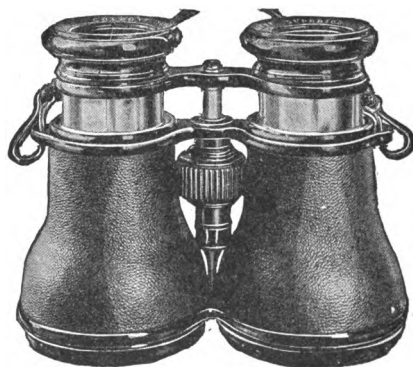
Field and Marine Glasses

Each in leather case, with handle and shoulder strap



8950 "Lemaire" Field and Marine Glasses, black morocco leather, japanned trimmings, high tops, fitted with highest grade lenses, with sun shades.

Size of object glass	1½	1¾	2	2¼ inches
Each	\$11.40	13.60	15.85	28.20



8955 "Colmont" Field and Marine Glasses, black morocco leather, japanned trimmings, high power achromatic lenses.

Size of object glass	1½	1¾	2	2¼ inches
Each	\$5.60	6.10	6.60	7.00

8960 "Marchand" Field and Marine Glasses, black morocco leather, japanned trimmings, extra large sunken eye-pieces, achromatic lenses, movable sunshades.

Size of object glass	1¾	2	2¼ inches
Each	\$3.80	4.15	4.50

SCIENTIFIC BOOKS

I—ARCHITECTURE, ART AND BUILDING CONSTRUCTION.

Abbott. Heraldry Illustrated. 700 Ill.....	2.00
Adeline. Art Dictionary. 2,000 Ill. 12 mo. 422 pp.....	2.25
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